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GOVERNMENT OF INDIA
MINISTRY OF AGRICULTURE

# A NOTE ON
# PROBLEMS OF CATTLE INSURANCE UNDER INDIAN CONDITIONS

August 1949.

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# PREFACE

In the following pages are presented the results of a study of the problems of Cattle Insurance in India, which was undertaken by me in August, 1949, as a part of my duties as an Officer on Special Duty in the Ministry of Agriculture. The immediate purpose of the study was to work out a detailed experimental scheme of Cattle Insurance which in course of its working could provide information on which more comprehensive schemes could be based.

I have pointed out that before inaugurating a pilot scheme it would be desirable to collect data about various basic factors which enter into a contract of Cattle Insurance, such as, rates of mortality and disability and variations in productivity and prices. I have also suggested the lines on which investigations for this purpose could be carried out. It is clear that a discussion of the problems of Cattle Insurance must remain incomplete as regards essential particulars until more precise information on these factors is available.

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New Delhi.

July 4 , 1949.

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# CHAPTER I.

## INTRODUCTORY.

### Need for Cattle Insurance in India.

1. It is easy to appreciate the urgent need for a scheme of cattle insurance in Indian conditions. "In no other country of the world are cattle of more importance than they are in India. Milk, though important, is a secondary consideration. The primary function of cattle is as draught animals for the plough or the cart. Without the ox, no cultivation would be possible; without the ox, no produce could be transported." Cattle in fact form the major part of the working capital of the cultivator and the provision for its maintenance and depreciation forms a substantial part of the costs of production of crops. On the other hand, the veterinary conditions in India are far from satisfactory. Epidemics of contagious diseases are widely prevalent and kill or incapacitate a large number of animals every year. The veterinary facilities are also limited and the ignorant cattle owner is often unwilling to avail himself of them even when they are within his reach.

The loss of a bullock means inability to earn his livelihood for the cultivator, and if it occurs at a critical stage, it may place the cultivator wholly in the power of the money-lender and ultimately involve him in ruin. The Royal Commission on Agriculture examined the reasons which led the cultivators to borrow from cooperative credit societies and pointed out that the experience of the credit societies in one province showed that borrowing for cattle purchase is mainly due to losses caused by disease. They gave the following figures as regards the loans granted by Cooperative Credit Societies for the purchase of cattle, expressed as a percentage of total advances.

| | Bihar & Orissa | Madras | Punjab | U.P. |
|---|---|---|---|---|
| 1924-25 .. | 13.0 | 7.5 | 20.75 | 37.7 |
| 1925-26 .. | 11.0 | 7.0 | 20.5 | 36.7 |

Dr. Narayanaswamy Naidu in his Report on Rural Indebtedness in Madras Province (1946) also pointed out that natural calamities causing crop failure and frequent outbreaks of cattle diseases constituted two major causes of indebtedness even among the prudent and toiling peasants and added that "without some device to absorb the schock of these periodical visitations it will be impossible to save the agriculturist from debt". The Famine Relief measures undertaken by government are intended merely to keep alive men and beasts during years of famine and are inadequate to meet the needs of the case. What is needed is some scheme to make good the losses caused by pestilence and famine, and to put the ryots on their feet again. Schemes of Crop Insurance and Cattle Insurance will serve this purpose.

2. It must be remembered that Cattle Insurance must be looked upon not only as a means of providing against calamities, but as a means of preventing their occurrence and reducing the extent of losses caused by them. This has been recognised as one of the major objectives of a scheme of Cattle Insurance and is of special importance in Indian conditions. In India, control of contagious and infectious diseases has been recognised as the most outstanding problem facing the various veterinary departments in the provinces and such control is yet exceedingly imperfect. In fact, in India, veterinary treatment is practically a state function and there are no private veterinary practitioners except in a few large cities and towns. Cattle Insurance may prove to be a very valuable means of securing the cooperation of the people in the work of the veterinary departments and of bringing the officials of the veterinary department into more intimate contact with the people. The need for the veterinary department to utilise the services of Cooperative Societies as an intermediate agency to persuade people to utilise services of veterinary personnel, report outbreaks of epidemics and to see that disease control measures are carried out was pointed out by the Cooperative Planning Committee. A Cattle Insurance Society has to perform these functions as a necessary condition for its successful operation and it profits directly from the success of measures of disease control. This has been widely recognised in foreign countries where Cattle Insurance has made

great headway. In national systems of Cattle Insurance such as the one prevailing in France, the societies have devoted considerable attention to raising the general level of hygiene among animals, popularising preventive measures and above all organising campaigns against the more dangerous contagious diseases. Special funds are formed for preventive work and to assist members to take the necessary measures. Circulars, pamphlets, articles in prominent papers, etc., are used as means of educating the owners in avoiding diseases and getting rid of them.

3. This aspect of the objectives of cattle insurance was emphasised in pointing out the intimate relationship between the work of a Credit Society and a Cattle Insurance Society by the promoters of Cattle Insurance in Burma. In his annual report for 1912, the Registrar of Cooperative Societies of Burma pointed out that "the credit obtained from credit societies is largely used to replace cattle dead of diseases that ought to be to a large extent preventible and in as much as it is better to save a beast than to replace it, insurance should rightly precede or at any rate accompany a credit system". In discussing whether Cattle Insurance could succeed until effective control of epidemic diseases had become possible, he remarked: "In Burma, the first necessity is to engender and foster a sound public opinion in favour of all measures capable of combating rinderpest. I see no way in which such public opinion can be fostered more effective and speedy than the formation of Cattle Insurance Societies."

4. In considering the benefits resulting from control of disease the serious indirect loss to the cultivator apart from the loss by death, which is compensated for by insurance, must be taken into account. The loss by death is only a small part of the loss that the cultivator suffers from epidemic disease. "Rinderpest is not so deadly when it attacks the ordinary cattle of the plains, but though the average mortality which fluctuates widely, may not be more than 30% of those affected, the remaining

70% are enfeebled by disease. Similarly,in case of foot-and-mouth disease, for every animal that dies 99 may be temporarily incapacitated". These indirect benefits resulting from a successful scheme of Cattle Insurance must be taken into account in evaluating the importance of the scheme.

5. In the words of the Royal Commission on Agriculture, on the improvement of India's cattle depends to a large degree that is little understood the prosperity of Indian agriculture. The two important factors in cattle improvement are feeding and breeding. Cattle Insurance may have a bearing on both of these. The Royal Commission wrote: "We have referred to lack of private enterprise in improving breeds of cattle. The reasons for this are no doubt manifold but one of these is the uncertainty of animal life. In some localities this is the usual reason given by cultivators for attempting to keep more cattle than they can feed properly; reserves are maintained lest some should be carried away by disease. Attention of the cultivators is therefore directed to increasing numbers when it should be concentrated on improving quality. Again, the risk of disease must deter those of the zamindars who might otherwise be willing to engage in cattle breeding." It will be easily seen that Cattle Insurance, by giving protection against losses caused by pestilence and disease, would enable a reduction in the number maintained by each cultivator and may improve standards of feeding. By removing the risk of loss of invested capital due to disease in epidemic form, it will encourage cattle breeding industry by attracting capital. For the same reasons, it will also encourage dairying industry. The need for insurance protection against unexpected damage to or destruction of the means of production in any industrial enterprise is now recognised. In India the cattle-breeding industry is mainly in the hands of small farmers owning only one or two animals who form their major means of subsistence. In these circumstances, the need becomes an urgent necessity. It may be remembered in this connection that an animal covered by insurance will form a superior security for a loan. This may be of importance, e.g., when a dairy wants an advance from a bank; or when a milk producers' union wants to give a loan to one of its members for purchase of animals or other reasons.

6. It will be seen, therefore, that a successful scheme of Cattle Insurance will bring varied benefits. It will bring security to the cultivator by protecting him against sudden losses of his working capital.

It will promote the prosperity of Indian agriculture by improving the health and efficiency of cattle. It will encourage cattle breeding and dairying industry in India. It will help the work of the veterinary departments in India by ensuring active cooperation between the department and the people.

## NATURE OF THE PROBLEM.

7. While the need for a scheme of Cattle Insurance may easily be appreciated, the difficulties in the way of successful operation of a scheme are also easily visualised. These will arise mainly from the ignorance and poverty of the average cattle-owner in India. It is unlikely that in the present conditions any initiative in the work of organising Cattle Insurance will be forthcoming from the cattle-owner himself. His ability to pay the requisite premium will be often inadequate; and his willingness to give up his ingrained fatalism and protect himself by insurance could only be ensured after considerable effort. Attempts at promoting Cattle Insurance through cooperative societies in the various provinces in India did not meet with any remarkable success. A main reason for this was the lack of sufficient appreciation and initiative from the cattle-owners themselves, which are essential for success of cooperative effort. A new sustained attempt at promoting Cattle Insurance must therefore necessarily be accompanied by an educative campaign of publicity; and secondly, considerable help and guidance by government by way of encouragement to initiative from cattle-owners will have to be provided.

8. It may be worthwhile mentioning here certain problems that will have to be considered in formulating a scheme of Cattle Insurance. These have been discussed at some length in the following pages.

One of the main difficulties which must be faced is the almost complete lack of information about cattle mortality in India. It is clear that a systematic attempt at promoting Cattle Insurance must be based on some reliable preliminary estimates of mortality rates. No published data on cattle mortality are at present available. It will, therefore, be necessary before an actual scheme is inaugurated to undertake investigations for collection of the necessary data. It may be remembered that the pilot scheme itself must be considered as a means of securing data about cattle mortality and about other features of insurance. It is necessary to bear this consideration in mind in deciding on the scale of operations of the scheme in various areas.

A second problem that will need attention is the bearing of the veterinary conditions in India on the scheme of Cattle Insurance. The control of contagious disease is yet very imperfect in India and any scheme of Cattle Insurance will have to provide protection against contagious disease. The necessary veterinary services are provided entirely by the state. Moreover, a peculiar feature in India is the absence of the private veterinary practitioner. On the other hand, adequate provision for veterinary treatment, immunisation of animals against contagious disease and prompt attention to outbreaks of contagious disease and adoption of prophylactic measures are all essential for the success of the scheme. It is essential therefore that provision for adequate and effective veterinary facilities should be made in formulating a scheme, and measures will need to be taken to see that the insured avails himself of them. Moreover the facilities may have to be provided at nominal cost or free of cost to the cultivator in view of his limited ability to pay. The agencies of the provincial veterinary departments will therefore have to be integrated in the machinery devised for administering the scheme and methods of doing this will have to be carefully considered.

A third feature that will need discussion is the appropriate form of organisation for administering Cattle Insurance during the pilot scheme stage. The practical alternatives in the present conditions will appear to be a scheme managed by cooperative societies with help from state in various forms and a completely state-managed scheme. Administration through cooperative socieities has the advantage of enabling close supervision of insured animals and may permit lower costs of administration. On the other hand, there will appear to be strong considerations in favour of a completely state-managed scheme. In any case, such non-official initiative as may be available during the early stages of the scheme will be inadequate for success of the scheme without considerable help from government, and government agencies will have to be utilised for helping the scheme in various ways. Direct participation of government in the administration as well as the undoubted solvency of a government scheme will help effective working. Careful thought will therefore have to be given to this aspect of the problem.

In case of a scheme managed through small societies, provision has to be made against difficulties that may arise in the event of the claims in any year exceeding the available funds of the society. The question of providing suitable reinsurance facilities arises in this connection. Other forms of state guarantees and state subsidies will also have to be considered. It may be remembered in this connection that a scheme of Cattle Insurance in Indian conditions could not be a success without considerable help from the state. It must be realised that Cattle Insurance is only another measure of cattle improvement and hence there is as much justification for government expenditure on it as on other measures of cattle improvement, such as bull distribution or disease control.

9. In the light of the discussion of the problems mentioned above, the details of the pilot scheme will have to be worked out. For this purpose, suitable centres will have to be selected for the operation of the scheme. In selecting centres the need for the experience obtained during the pilot scheme stage to be of direct utility for extending the scope of the scheme will have to be borne in mind. Moreover, centres will be selected where conditions are considered to be generally favourable for success of the scheme. Next, it will be necessary to select the classes of animal which should be covered by insurance. This will be done with reference to the objectives of the scheme. Mortality of cattle depends on conditions regarding treatment, housing, feeding, etc. It is clear, therefore, that the status of the owner as well as the value of the insured animal to him are important considerations in deciding on the classes of animals to be covered by insurance. Again, the form of the contract and the details of the conditions of insurance will also need to be considered. In this connection an unusual form of contract, which has certain advantages as compared with the usual form of Cattle Insurance contract, is described in Chapter III. Lastly, a suitable administrative machinery for operation of the scheme will have to be suggested.

10. Schemes for collection of data on cattle mortality are suggested in

Chapter VI. The details of the scheme could only be finalised after the investigations there suggested are carried out. However, the various features of the scheme have been discussed in their broad aspects on the assumption of rates of premiums which appeared reasonable.

# CHAPTER II.

# BACKGROUND INFORMATION FOR A SCHEME OF CATTLE INSURANCE IN INDIA.

1. Before proceeding to discuss a scheme of Cattle Insurance in India, it will be useful to present some information about the cattle population in India to serve as a background against which the various aspects of the problem may be visualised. Information about the relative sizes and importance of various classes of animals based on species, sex, age and utility should help to see the problem in correct perspective. Information about main breeds and breeding regions in India will also be of value in this connection. An account may also be given of an attempt to divide India into regions from the point of view of health and efficiency of animals. Further, from the point of view of Cattle Insurance information about variation in values of animals of different classes according to age and level of productivity is also of direct importance. In addition to this, it is clear that data bearing on mortality of animals due to different causes should be considered as of basic importance. No information on this point is however available except as regards contagious diseases. This has been presented in chapter IV and in appendix A.

## Distribution of Indian Cattle Population.

1. Quinquennial all-India Censuses of Livestock population in India are being taken since 1919-20. The procedure used since 1940 for enumerating the bovine population is as follows:-

Cattle in India belong to two different species, viz., oxen and buffaloes. The animals of each species are classified into young stock aged under 3 years and adults. The young stock is further divided into those under 1 year and those between 1 and 3 years. Each age-group is classified further into male and female animals. The adult males are subdivided into breeding bulls, working bullocks and unserviceable stock; and the adult females into breeding cows, working cows and unserviceable stock. The breeding cows are further classified into those in milk, dry and not calved. The accuracy of the census figures in certain areas leaves room for doubt. Further, comparisons are made difficult by frequent changes of classifications from census to census and between one area and another, and owing to breaks in the participation of certain areas in various censuses. Figures for rural and urban areas in each district are shown separately.

3. In 1945, Indian Union possessed approximately 177 million cattle. Of those 136 million were oxen and 41 million buffaloes. The Indian oxen represent nearly one fifth of the recorded oxen population of the world; and the Indian buffaloes represent nearly a half of the total recorded world population of buffaloes.

In 1940, nearly 68.8% of the oxen in undivided India were serviceable stock. These comprised breeding bulls (0.4% of total oxen), working bullocks (36.9% of total oxen) breeding cows (29.5% of total oxen) and working cows (2% of total oxen). The total young stock was 28.5% and the unserviceable stock 2.7% of total oxen. For the country as a whole the density worked out at 106 oxen per sq. mile and 43 oxen each per 100 acres of cultivated land and 100 persons.

In 1940, 60.8% of the buffaloes in undivided India were serviceable stock. These comprised breeding bulls (0.8% of total buffaloes), working males (12.1%) and breeding she-buffaloes (46.1%) and working she-buffaloes (1.8%.) The young stock represented 37.8% of total buffaloes and unserviceable stock 1.4%. The all India buffaloes density worked out at 12 buffaloes each for 100 acres of cultivated area and 100 persons, and 30 buffaloes per sq. mile.

In 1945, among oxen the proportion of males among adult animals was 40.7% while among buffaloes the proportion of males among adults was only 14.2%. The reason for this disparity lies in the comparative utility of the two species. The oxen males are preferred to male buffaloes for agricultural purposes owing to their comparative lightness and active nature. Cows in rural areas are maintained for producing bullocks rather than for milk. She-buffaloes on the other hand are considered to be better dairy animals than cows. The male buffaloes are neglected and many of them die or are sold for slaughter before they attain maturity.

In 1940, of the milch animals in undivided India 96% of cows and 94% of she-buffaloes were located in rural areas and only 4% of milch cows and 6% of she-buffaloes were found in cities and towns. The number of milch animals in urban areas were as follows:-

(Numbers in thousands)

| Province | Assam | Bengal | Bombay | C.P. | Delhi | Madras |
|---|---|---|---|---|---|---|
| Cows. | 18.6 | 186.5 | 77.2 | 103.2 | 3.4 | 472.4 |
| She-buffaloes. | 0.1 | 17.7 | 129.2 | 48.9 | 2.5 | 323.6 |

In 1940, the densities of animals in the various provinces on different bases were as follows:-

| Province | | Bengal | Bihar | Bombay | C.P. & Berar. | Madras | Punjab | U.P. |
|---|---|---|---|---|---|---|---|---|
| Density per square mile | Oxen | 292 | 181 | 94 | 85 | 129 | 93 | 218 |
| | Buffalo | 14 | 42 | 32 | 16 | 49 | 62 | 87 |
| Density per 100 acres of cultivated area. | Oxen | 78 | 47 | 21 | 39 | 39 | 30 | 60 |
| | Buffalo | 4 | 11 | 7 | 8 | 15 | 20 | 24 |

4. The trend of cattle population in India based on the number of oxen and buffaloes in areas common to the five censuses was as follows:-

Percentage to 1919-20

| Census year | 1919-20 | 1924-25 | 1929-30 | 1935 | 1940 | 1945 |
|---|---|---|---|---|---|---|
| Oxen | 100 | 101.3 | 107.8 | 111.9 | 104.9 | 103.0 |
| Buffaloes | 100 | 104.1 | 112.5 | 122.5 | 118.7 | 120.7 |

5. The distribution of the cattle population over the various provinces in the Indian Union according to the Census of 1945, is shown in appendix I to this chapter.

## Regional Distribution of Cattle.

6. In considering problems bearing on the health or efficiency of cattle it is useful to make use of a division of the country into regions according to environment, suggested by Dr. W. Burns, in his monograph on the Technological Possibilities of Agricultural Development in India. He divided the country into three climatic regions for this purpose, since

climate was the main and immutable factor of the environment. The first is the Wet Region consisting of areas with a rainfall of 70 inches and over, comprising the Konkan districts of Bombay, Bengal, Assam, and West Coast districts of Madras. The second was the Medium Rainfall Region with a rainfall of 30 to 70 inches. This comprises Bihar, Orissa, C.P., U.P., the Gujarat districts of Bombay and Northern Circars, Carnatic, Central and Southern Districts of Madras. The third was the Dry Region with a rainfall of under 30 inches. This consists of the Punjab, Delhi, Ajmer-Merwara, Deccan districts of Bombay, and of Madras. The States in corresponding areas will be included in corresponding regions. The differential productivity and capacity of work of cattle in these regions as well as the distribution of cattle among them may be seen from the following table, adapted from the same monograph. The figures relate to undivided India.

| Region | Areas of cultivated land (Millions) | No. of animals. |  |  | No. of acres cultivated per pair of of bullocks. | Milking capacity (lbs.p.annum) |  |
|---|---|---|---|---|---|---|---|
|  |  | Male cattle (Millions) | Milch cows | She buffaloes. |  | Cows | She-buffaloes. |
| I(above 70") | 48.6 | 12.7 | 11.0 | 0.7 | 7.6 | 371 | 732 |
| II(30"-70") | 137.3 | 28.1 | 20.4 | 9.5 | 9.8 | 463 | 1050 |
| III(Below 30") | 78.2 | 8.2 | 5.8 | 4.8 | 19.2 | 774 | 1615 |
| British India. | 264.1 | 48.9 | 37.3 | 15.0 | 10.8 | 484 | 1216 |

### The Chief Breeds of Indian Cattle.

7. According to trade demands and climatic and soil conditions a number of breeds of both the species have developed in different parts of the country. These may be classed as milch, draught and dual purpose breeds. In foreign countries, a 'dual purpose' breed means one in which the females yield a fair quantity of milk and the males produce good quality beef. In India beef production is of little importance. A 'dual purpose' breed is therefore one in which the females are good milkers and males powerful draught animals. The existence of such indigenous breeds has been utilised for the purpose of cattle improvement and the main breeding areas in the

various provinces may indicate areas favourable to health and efficiency of cattle in which animals have good value.

Considerable information on the different breeds, the districts to which they are indigenous, the areas of their demand, estimated number and strength of each breed, utility, etc., are given in the Cattle Marketing Report and various publications of the Indian Council of Agricultural Research. (Miscellaneous Bulletins Nos. 17,24,27,46,47,54). It may suffice here to mention the main breeds in the different provinces in India.

| Province | Oxen | Buffaloes. |
|---|---|---|
| Madras and Mysore | Kangayam, Amritmahal, Hallikar, Alambadi, Ongole, Krishnavalley | |
| Bombay | Dangi, Gir, Kankrej, Khillari | Jaffrabadi, Mehsana Surti. |
| C.P. & Berar & C.I. States | Gaolao, Malvi, Nimar | Nagpuri |
| U.P. | Kanwariya, Kherigarh, Mewati, Ponwar. | |
| Bihar | Bachaur, Purnea, Shahabadi | |
| Punjab & Delhi. | Hariana, Hissar, Sahiwal | Nili Ravi, Murrah. |

## Prices of Cattle.

8. It will be useful from the point of view of the problems of cattle Insurance to understand the nature of the variation of prices according to age, productivity, etc. Some information in this connection is available in the Cattle Marketing Report, in which an attempt is made to analyse and interpret prices prevailing in certain cattle breeding areas and in the principal markets on the basis of data obtained from cattle dealers and breeders. The following information has been taken from this Report.

9. The factors affecting the price of draught animals are as follows:

(a) Disposition and colour, size and body weight.

(b) Age. Young draught animals below the age of 4 years being raw and untrained are sold at comparatively cheap rates. Bullocks between the ages of 4 and 8 are in the prime of their youth, render the best services and therefore fetch the highest price. As they grow old their capacity for work and price gradually diminish. The following table illustrates this:

| Market | Breed | 4 yrs. | 4-8 yrs. | 8-10 yrs. | 10 yrs. and above. |
|---|---|---|---|---|---|
| Singagi Fair, C.P. (1936) | Malvi | 41 | 62 | 58 | 36 |
| | Nimari | 23 | 37 | 31 | 20 |
| Punjab (1935) | Hariana | 80 | 105 | 85 | 70 |
| | Dhanni | 100 | 140 | 115 | 90 |
| | Mixed | 28 | 36 | 32 | 19 |

(c) Breed. Certain famous breeds invariably fetch higher prices. The following prices relating to the year 1937 illustrate this.

| Province | Breed | Price | Description |
|---|---|---|---|
| Madras | Amritmahal | 115 | 3-4 years old |
| | Kangayam | 94 | " |
| | Ongole | 106 | " |
| | Mixed | 56 | " |
| Bombay | Kankrej | 145 | 6-7 years old. |
| | Khillari | 138 | " |
| | Deoni | 88 | " |
| | Mixed. | 44 | " |
| C.P. | Nimar | 85 | 6-8 years; |
| | Nagore | 125 | 500-800 lbs. |
| U.P. | Nagori | 110 | " " |
| | Panwar | 30 | " " |
| | Mixed. | 18 | " " |
| Punjab. | Hissar | 90 | 6-8 years old;800-1000 lbs. |
| | Dajjal | 80 | " " " |
| | Mixed | 60 | " " " |

(d) Locality. There is an increase of 10 to 20% when bullocks are moved from breeding tracts to their marketing centres.

(e) Season. There is a keen demand for animals during the sowing seasons of crops. The prices, therefore, rise with the approach of tilling season and fall when agricultural operations are in a quiescent stage.

(f) Pair. Two bullocks having similar size, colour, and capacity fetch a higher price.

10. The factors influencing prices of milch animals are as follows:

(a) Performance - daily milk-yield, stage of lactation and the presence or absence of cow at heel.

(b) Age. A cow is usually at her best as regards milk production in the second lactation and a she-buffalo in her third and fourth lactation. As the cow advances in age the quantity of milk generally diminishes. The price therefore depreciates with advancing age. This may be seen from the following table.

Average prices of Cows and Buffaloes in different lactations (1937).

| Animal | Production | Lactation 1-2 | Lactation 3-4 | Lactation 5th & later |
|---|---|---|---|---|
| Cows in Hariana & Malva tract | 2-3 seers | 35 | 30 | 25 |
| | 4-5 " | 50 | 45 | 40 |
| | 6-8 " | 70 | 60 | 50 |
| | 10 seers and over | 100 | 90 | 70 |
| Buffaloes in Amritsar. | 2-3 seers | 35 | 35 | 30 |
| | 4-5 " | 65 | 65 | 50 |
| | 6-8 " | 90 | 90 | 75 |
| | 10 seers and over. | 115 | 115 | 90 |

(c) Breed. For the same age and productivity, a better breed will fetch a higher price.

(d) Pregnancy, conformation, temperament & colour.

(e) Locality. Prices are higher in town and cities than in villages.

Incidental factors must also be considered. During famines and floods, the owners may want to dispose of their animals at cheap prices. After the termination of an out-break of cattle disease in epizootic form the abnormally high demand for replacements may raise prices. The after-effects of foot-and-mouth disease and other diseases often make the animals temporarily unserviceable when they are sold at low prices; the decrease may range between 10 & 60%.

10. As a result of the war the prices of animals have shown a progressively upward trend. The following figures giving average prices in Rupees will show the picture upto the end of 1943.

Plough Bullocks.

| | 1934-38 | 1939 | 1941 | 1943 |
|---|---|---|---|---|
| Balaghat, C.P. (Gaolao) | 35 | 50 | 70 | 100 |
| Kolhapur (Krishna valley) | 148 | 175 | 200 | 238 |
| Radhanpur (Kankrej) | 135 | 148 | 163 | 350 |
| Rohtak (Hariana) | 60 | 65 | 80 | 200 |

Cart Bullocks.

| | 1934-38 | 1939 | 1941 | 1943 |
|---|---|---|---|---|
| Bangalore (Hallikar) | 175 | 175 | 200 | 350 |
| Lucknow (Hissar) | 87 | 110 | 155 | 350 |

| | 1934-38 | 1939 | 1941 | 1943 |
|---|---|---|---|---|
| | Dairy Cows. | | | |
| Kosikulan (Hissar) | 65 | 72 | 80 | 120 |
| Rohtak (Hariana) | 50 | 60 | 70 | 150 |
| | Buffalo-Cows. | | | |
| Lucknow (Murrah) | 128 | 155 | 180 | 260 |
| Junagadh (Jaffarabadi) | 100 | 105 | 110 | 200 |

## APPENDIX TO CHAPTER II.

### Distribution of Cattle Population according to the Census of 1945.

| Province/State | Oxen<br>Young stock 3 years and under. (Millions) | Cows over 3 years. (Millions) | Bulls over 3 years. (Millions) | Buffaloes.<br>Young stock 3 years and under. (Millions) | Cows over 3 years. (Millions) | Bulls over 3 years. (Millions) |
|---|---|---|---|---|---|---|
| Assam | 1.4 | 1.3 | 1.7 | 0.1 | 0.2 | 0.2 |
| Bihar | 2.8 | 3.4 | 5.2 | 0.9 | 1.3 | 0.7 |
| Bombay | 2.6 | 2.9 | 4.7 | 1.5 | 2.2 | 0.3 |
| C.P. & Berar. | 4.1 | 4.6 | 5.1 | 0.8 | 1.0 | 0.7 |
| East Punjab | 1.4 | 1.1 | 1.7 | 1.3 | 1.4 | 0.2 |
| Madras | 3.6 | 5.9 | 7.0 | 2.1 | 3.1 | 1.2 |
| Orissa | 2.0 | 2.8 | 3.1 | 0.2 | 0.3 | 0.4 |
| U.P. | 5.5 | 5.3 | 10.2 | 3.3 | 4.4 | 0.8 |
| West Bengal | 2.1 | 2.8 | 3.0 | 0.1 | 0.1 | 0.4 |
| Other provinces | 1.6 | 0.6 | 0.6 | 0.1 | 0.3 | - |
| Total Indian provinces | 27.1 | 30.7 | 41.3 | 10.5 | 14.3 | 4.9 |
| Indian states | 11.2 | 12.7 | 13.0 | 4.5 | 5.6 | 0.9 |
| Grand Total | 38.3 | 43.4 | 54.3 | 15.0 | 19.9 | 5.8 |

Note: Provinces include merged states.

# CHAPTER III.

## Nature of the Contract of Cattle Insurance in Indian Conditions.

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### The usual type of contract of Cattle Insurance.

#### (a) Form of the Policy.

1. It is easy to visualise the form of contract of Cattle Insurance by comparing it with a contract of term insurance on human lives. Under such a contract a sum assured is payable in the event of death occurring during a specified period. Those who survive the period, therefore, get no benefit in return for the premium paid by them.

A point of distinction lies in the very short period of a cattle insurance contract. It may be remembered that the life of cattle is comparatively much shorter, the maximum age being only about 15 years. However, the reason for the shortness of the period of contract is the much stronger moral hazard which operates in this form of insurance. The possibility of a human being being killed for the insurance money is comparatively remote. But in case of insured property the moral hazard resulting from over-insurance is great. There is always the chance that the owner may be tempted to stealthily kill the animal that has depreciated in value below the insured amount. To guard against this, an animal is only partially insured. Thus it is usual in India to confine insurance of cattle to only two-thirds or one half of their value at the time of insurance. In the event of death, therefore, the owner has to bear a part of the loss himself and the remaining part is borne by the insurer. One of the special features of the value of cattle is the possibility of very sudden fluctuations in value due to a variety of factors. Cattle appreciate in value as their productive efficiency increases and then after a period of maximum value, depreciate in value as age advances. A general idea of age variations in prices will be obtained from the data about prices given earlier. Thus it may happen that a bullock which has a maximum value of 100 rupees at full maturity, say, in age-group 4-8, may have a value of 85 rupees during age group 8-10 and only 60 rupees during ages after 10 years. Further, during recent years there has been a progressive upward trend of prices. It will be seen from the figures given earlier that between 1934-38 and 1943 prices increased substantially, sometimes to values more than 300% as large. In the event of long period insurance, it may happen, therefore, that the actual price may sink below the insured amount as a result of a substantial fall in the prices of animals. But in addition to these, there are factors which may reduce prices suddenly. Disability of animals-physical, productive or reproductive - may be one such reason. Diseases like foot-and-mouth disease render the animals temporarily unserviceable and may reduce prices from 10 to 50%. Similarly, conditions of fodder famine or drought may make it impossible to maintain cattle and the prices may reach such low levels that the temptation to secure the insurance money by malfeasance may prove irresistible. It will be seen that partial insurance is not by itself a sufficient guarantee against moral hazard. Provision is therefore made for valuing the animals at frequent intervals, such as six months or a year and the period of insurance is confined to such a small period. This adds considerably to the cost of insurance and makes administration of insurance much more complicated than it would otherwise be. But this would seem to be a necessary precaution. It is also usual to confine insurance to the main working life-time of the animal such as the ages from 4 to 10 or 12. During such period, the possible variation in prices would be comparatively smaller. It may be remembered also that apart from any deliberate malfeasance, in years of distress, animals of least value will suffer most from neglect, and will be the earliest to succumb. There would not appear to be the same force in the reasons for refusing insurance before the age of 4, but it is well-known that young stock is susceptible to certain forms of disease and is likely to suffer from neglect as compared with the more productive working animals. The minimum and maximum ages for insurability may however be varied between different classes of animals in the light of data about productivity and mortality which may be collected.

2. The policy in its ordinary form provides an indemnity in respect of loss of animals through death caused by accident or disease, except tha

arising from certain specified causes. In foreign countries, certain types of risk such as fire and lightning, transit by water, surgical operation including inoculation, breeding risk, certain types of contagious disease, etc., may be excluded from the cover provided by the main form of policy and it may be possible to provide protection against these on payment of an extra premium or by special insurance against these specific causes. In India most causes are included. The bye-laws of the Cattle Insurance Societies in India provide for the exclusion of the following causes of loss:

(a) Theft or loss by straying;
(b) Journey by rail or steamer;
(c) Act of a third party who is legally liable to compensate the owner;
(d) Ill-treatment or culpable negligence on the part of the owner; in particular, contagious disease where the member has failed to inform the insurer of the outbreak or to take such measures for segregation as he may be directed by the insurer or government to take.

### (b) Policy conditions.

3. Cattle Insurance policies are not transferable from one animal to another or from one insured to another, so that the currency of the policy expires if the animal is sold. Certain facilities in this respect were however provided by the Societies in India. Animals bought to substitute animals sold could be substituted, provided their value was practically the same. However, it would be desirable to insist on the necessary procedure in the case of such substituted animals as if they were animals newly insured. No refund of premium was allowed in case an insured animal is sold by an owner. However, in case an animal is sold to another member of the Cattle Insurance Society, the policy may be transferred to the purchaser. In fact, it may be provided that the policy may be continued in force provided the animal was not removed outside the area of operation of the society and the purchaser became a member of the Society. Animals

removed outside the area of operation of a Society would not be available for inspection by the Society and therefore it may be necessary to provide that the policy in such cases would cease to be in force.

4. It is sometimes provided that no member shall insure more than a certain number of animals, such as 10, probably with the idea that when animals are kept together in numbers there is greater danger of spread of contagion, so that the death rate among them is likely to be higher. Strictly speaking, in such cases an extra premium may be demanded even in the case of the insured animals, but perhaps such cases may be rare; moreover, the owners may be of a superior status.

5. It is also provided sometimes that all insurable animals owned by the insured must be offered for insurance. Where the owner is allowed to select the animals to be insured it is natural that the owner should insure those regarding whose soundness he is doubtful. Perhaps, however, owing merely to inability of the owner to pay premiums on all animals, the owner may like to offer only the more valuable animals for insurance. To allow for such cases, the insurer may be given option to exempt certain animals from insurance.

6. When an animal is newly purchased it may not be possible to be sure that it is entirely free from disease and is likely to thrive in its new surroundings until it has been for some little time on its new owner's premises. It may therefore be provided that newly purchased animals may not be insured until they have been in the owner's possession or on his premises for at least a month.

7. Provision is made for marking the insured animals for facilitating identification. For example, insured animals may be branded with the Insurer's mark on the right fore-foot. In addition, a detailed description of the animal will be registered in insurer's books.

8. The animals are revalued on fixed dates once or twice a year.

### (c) Classes of animals Insured.

9. It is usual to confine insurance to only certain classes of animals. The following table shows the position in this connection as visualised by the model bye-laws of Cattle Insurance Societies in

the various provinces in India.

| Province | Type of animal insured. | Sum assured (fraction of value) | Premium rate per annum (Percentage of value of the animal) | Age limits for insurance. |
|---|---|---|---|---|
| Punjab | Plough and draught bullocks and female buffaloes. | Two-thirds | 5% | 4-12 yrs. |
| U.P. | Bullocks and Male buffaloes. | One-half | 3⅛% | " |
| Bombay | Bullocks and male and female buffaloes. | Two-thirds | 5% | " |
| Coorg | Plough cattle | A different type of contract. | | " |
| Madras | All oxen and buffaloes. | Two-thirds | | |

It will be seen from the above table that cows are in all cases excluded from the class of insurable animals. The reason for this may be found in the following remarks of the Royal Commission on Agriculture, 1928:

"The ordinary cultivator does what he can for his plough cattle and his she-buffaloes; quite often he does well for them, but bad seasons create difficulties for even the best cultivator and the best of his cattle. The cow is less fortunate; she gets little stall-feeding and has to seek the greater part of her food where she can; young cattle and the male offspring of her rival the she-buffalo, share her fate and pick up their livelihood on common grounds, or by raiding crops, and who that knows these common grazings can blame the raiders?" "Broadly it will be true to say that if there is any fodder available after the draught cattle are fed, she (the cow) gets it, or shares it with the young stock; for the rest she is left to find food where she can. Where the cow provides some milk for the household, as well as for her calf, cultivators try to spare her two or three pounds of mixture of cotton-seed and bran, or oilcake or pulse, but where the milk fails, the ration is withdrawn and she is turned adrift to find a living for herself on 'grazings'."

"The she-buffalo rather than the cow is the milk producing animal of India. Her milk is richer and wherever there is good market for milk and its products it is the buffalo that is kept to supply it. Her treatment is very different in most localities than that of the cow. She is carefully tended by the women of the household, and not infrequently selection is exercised in her breeding."

It will be clear from the foregoing extracts that the cow will form a very bad risk for insurance. On the other hand, from the point of view of the needs of the ordinary cultivator it will be sufficient to insure the male bullocks who may have to be immediately replaced on death. It may suffice therefore, to confine insurance in rural centres to plough and draught bullocks. Perhaps female buffaloes in such areas could, if desired, also be included in the class of insured animals.

10. It may be remembered however that one of the objectives of a Cattle Insurance Scheme should be to promote dairying and production of milk. It may be remembered in this connection that most of the milk is produced in rural areas while the profitable market for milk and milk products is largely urban. It may be expected that milch animals may have a good value and receive better treatment in cities and towns and surrounding areas. Cooperation in the marketing of milk has made considerable progress in such areas. It may be advisable to provide centres for insurance of milch animals in such areas, and perhaps areas in which the cooperation Milk Supply Unions operate may be suitable for the purpose.

### (d) Differential Premium Rates for Different Classes.

11. It will be noted from the above table that where both male and female animals are insured, it has not been usual in India to charge differential rates for species or for sex, except in Madras. One reason of course is that the premium rates have not been based on any adequate statistical basis. There would seem to be a case for

charging differential rates for the two sexes as it appears reasonable to expect higher mortality among female animals. An idea of relative rates charged for different classes of animals by private companies in U.K. may be obtained from the following table:

| Class of animal | Ages at entry | Premium for a sum assured of £.100. |
|---|---|---|
| Bulls | 6 months to 6 yrs. | £. 4- 0-0 |
| Fattening cattle | not exceeding 8 yrs. | £. 5- 0-0 |
| Dairy cows(including calving risk), if has recently passed tuberculin test. | -do- | £. 6- 5-0 |
| -do- (untested). | -do- | £. 7-10-0 |

It will be clear that in any mortality investigation that may be undertaken for the purpose of ascertaining premiums, separate rates of mortality will have to be obtained in case of cattle and buffaloes and male and female animals. The premiums may then be based on these. In the meanwhile, it may be pointed out that the practice of charging separate rates for male and female animals has much to commend it.

### An unusual type of contract of Cattle Insurance.

12. The usual type of cattle insurance policy is a one year or half year contract under which the indemnity is payable only in the event of death due to insured causes. In view of the substantial variations in the value of cattle due to a variety of reasons, the sum assured has to be varied at intervals of every six months or a year on the basis of revaluation of the insured animal, so as to guard against the moral hazard resulting from over insurance. Under a policy of this type it is to be expected that a majority of cattle owners who have insured their animals over a period of years without their policy resulting in a claim may get the feeling, however unjustified, that they have paid money by way of premiums without getting anything tangible in return. At the end of the working life time of the animals they will also be faced with the problem of providing for replacement of the animal, unless they have anticipated this by investing in the rearing of an animal on the farm or by accumulating savings for purchase of animals. Cattle Insurance in the usual form

should facilitate the raising of a loan for the purchase of an animal but it is clear that a policy which enables provision to be made for depreciation in time should prove attractive to at least the better class of cattle-owner. This will be comparable to an Endowment Assurance on the life of an animal while the ordinary form of policy is a term insurance contract.

13. A policy of this form was current in Coorg where Cattle insurance had made considerable headway during the years 1913-19; although after this period no improvement seems to have been shown and the last cattle insurance society was liquidated in 1925. The contract has been described in the following rules.

1. Premium is payable for 4 years only after which period the insurer is entitled to the full value of the policy, provided that the insured animal is certified to be unfit for work or dead. In the meantime, the value of the policy is invested in the society at 6¼% interest.

2. The insurance will accept only two-thirds of the actual value.

3. No animal above the age of 7 years will be accepted.

The rules probably should be interpreted as follows:
If the animal dies during the 4 years or becomes incapacitated the sum assured will be payable not immediately on the happening of the event but at the end of the 4 years; if the animal dies or becomes incapacitated after 4 years the sum assured will be paid immediately on the happening of the event.

The premiums payable over the 4 years totalled up to the sum assured but decreasing amounts were payable over successive years. The premiums payable during the 4 years were respectively equal to 3/8,2/8,2/8 and 1/8 of the sum assured. Each year's premium was paid in equal monthly instalments. The maximum amount of insurance specified in the rules appears to have been Rs 18/-, the monthly premium instalments for successive years for this amount being respectively Rs -/9/-, -/6/-, -/6/- and -/3/-.

14. It will be seen that the main idea in this form of contract is that the entire sum paid as premiums is returned without interest

to the cattle owner, on survival of the animal to the end of the term of the policy. Moreover, in case the animal dies during the term of the policy, he gets an equal sum on paying a smaller sum by way of premiums, since no premiums will be paid after the insured animal dies. Further, if the death benefit is made payable immediately on death, the insured will get this sum before the end of the term. It is clear that the policy must be so designed that the interest earned must suffice to pay for these additional benefits as well as for expenses or for that part of the expenses which is borne by the fund. The idea of returning the entire amount of premiums paid as survival benefit will no doubt appeal to the mind of the cultivator and should make this form of contract popular. However, in case it is found that the interest earned in present conditions is not adequate for the purposes specified above, one way of modifying the contract would be to reduce the survival benefit by a small percentage; perhaps it may also be desirable to reduce the sum assured by gradual stages as to make the sum payable on death during the last year of insurance equal to the survival benefit.

15. It will be seen that a large element of investment enters into this form of contract. It is this fact which reduces the moral hazard and may permit of a long term contract. Perhaps the following additional provisions would add to the workability of the contract from this point of view.

1. The maximum sum assured under this form of contract may be limited to one-half of the value of the animal, even if under the ordinary form of contract a sum assured equal to a larger proportion of the value is permitted.

2. A Discontinuance Benefit may be allowed to the policy-holder in case of his discontinuing the policy. This may be calculated on the basis of the premiums paid with a suitable deduction for the risk covered and expenses.

It is easy to appreciate how under a contract of this type the moral hazard will be substantially minimised. The moral hazard arises as a result of the sum obtainable under the policy on death of the animal exceeding the value of the animal. Where a discontinuance benefit is payable, the additional sum obtained as result of the death of the animal is equal to the difference between the sum assured under the policy and the discontinuance benefit. This difference will decrease at a fast rate as the discontinuance benefit increases and provided the value of the animal does not fall below it, there may be little moral hazard.

The position may be clarified by an example. Suppose the value of the animal at the inception of a policy is Rs 200/-. The maximum sum assured under the policy would then be Rs 100/-. Suppose the premiums are paid annually in one sum and are respectively Rs 37-8, 25, 25 and 12-8. Assume further, that the discontinuance benefits on payment of first three premiums are respectively Rs 30/-, 50/- and 70/-. The additional benefits obtained as a result of death of the animal during successive years are then respectively Rs 70/-, 50/-, 30/- which represent 35%, 25% and 15% of the value of the animal. It is exceedingly unlikely that values of animals will fall below such proportions during the first three years after the inception of the policy, except perhaps in case of permanent incapacity. It may be provided, as in case of Coorg Scheme, that benefit may be payable on occurrence of permanent disability provided its occurrence is established to the satisfaction of the insurer.

16. It is clear that one of the main difficulties in the way of popularity of this form of contract will be the high premium rates necessary if the sum assured is to be comparable to the value of the animal. Thus for a sum assured of Rs 125/- the monthly premium may be Rs 3/15/-, 2/10/-, 2/10/- and 1/5/-. This will necessarily restrict the class of cattle owner who can take a policy of this kind. It would appear, nevertheless, that this form of contract may have considerable attraction and its feasibility under the present conditions may be investigated. It may be remembered also that contracts for sums assured lower than the maximum sum permitted under the rules, as determined by the value of the animal, may be taken to suit the abilities of the owner to pay premiums.

It is clear that one of the ways of decreasing the premiums payable in any year for a given sum assured would be to extend the period over which the premiums are payable. It would be desirable that the period of premium payments should not extend beyond the working life time of the animal but consistently with this condition, workability of contracts of 5 or 6 years' durations may be investigated. However, this type of policy is based on the principle of the interest earned being utilised to pay expenses and the additional cost of the death benefit, and a short term and an earlier accummulation of the premiums have advantages from this point of view. Further, it would appear that a rate of interest of 6¼% could not be counted upon in the present investment conditions and the workability of the contract will have to be investigated on the basis of much lower premium rates such as 2½% or 3%.

The following table should help in the appreciation of the resultant effect on a contract of this type of various factors involved such as interest, mortality (or loss due to mortality and disability), term of premium payment and the relative sizes of premiums payable over successive years. For simplicity it has been assumed that the sum assured will be payable on death or incapacity if it occurs during the period of premium payment and otherwise at the end of this term. A uniform rate of decrement due to mortality and incapacity has been assumed to operate over the successive years during the term of premium payment. Each one of these assumptions may be expected to introduce slight margins of safety in the estimates.

1. Term of premium payment 4 years.

(a) Annual premiums during successive years for a sum assured of Rs 100 : Rs 37-8; 25-0, 25-0, 12.8.

Margins available in the premiums for expenses etc., on different assumptions as regards mortality and interest:

| Mortality | Interest | | | | |
|---|---|---|---|---|---|
| | 2% | 3% | 4% | 5% | 6% |
| 5% | 3.9% | 6.3% | 8.7% | 10.9% | 13.1% |
| 6% | 3.4% | 5.8% | 3.2% | 10.4% | 12.6% |
| 7% | 2.9% | 5.2% | 7.5% | 9.8% | 12.0% |

(b) Annual premiums during successive years:Rs 25, 25, 25, 25.

Margins available in the premiums for expenses etc., on different assumptions as regards mortality and interest:

| Mortality | Interest | | | |
|---|---|---|---|---|
| | 3% | 4% | 5% | 6% |
| 5% | 3.2% | 5.7% | 7.6% | 9.6% |
| 7% | 1.6% | 3.8% | 5.7% | 7.8% |

2. Term of premium payment 5 years.

(a)(i) Annual premiums during successive years in respect of a sum assured of Rs 100/- : 30, 25, 20, 15, 10.

Margins in the premiums:

| Mortality | Interest. | |
|---|---|---|
| | 3% | 5% |
| 5% | 5.6% | 11.2% |
| 7% | 3.6% | 8.8% |

(a)(ii) Annual premiums during successive years: 25, 20, 20, 20, 15.

Margins in the premiums:

| Mortality | Interest. | |
|---|---|---|
| | 3% | 5% |
| 5% | 3.4% | 8.55% |
| 7% | 0.7% | 5.6% |

(b) Annual premiums during successive years Rs 20, 20, 20, 20, 20.

Margins in the premiums:

| Mortality | Interest. | |
|---|---|---|
| | 3% | 5% |
| 5% | 1.9% | 6.7% |
| 7% | Premium insufficient | 2.6% |

3. Term of premium payment 6 years.

(a) Annual premiums for a sum assured of 100 years.

Rs 25, 18¾, 18¾, 12½, 12½, 12½.

Margins in premiums:

| Mortality | Interest. | |
|---|---|---|
| | 3% | 5% |
| 5% | 3.6% | 9.7% |
| 7% | 0.06% | 5.9% |

(b) Annual premiums for a sum assured of Rs 100, Rs 16-2/3 every year.

Margins in the premiums:

| Mortality | Interest 3% | Interest 5% |
|---|---|---|
| 5% | 0.2 | 5.6% |
| 7% | Premium insufficient | 0.8% |

The foregoing investigation would appear to show that under the present investment conditions contract of this form would not be self-supporting in the sense of the premiums containing an adequate provision for the necessary expenses, except perhaps contract 1 (a). It is, however, desirable that at-least during the experimental stage the Government should subsidise the scheme by bearing the whole or a substantial proportion of the expenses of administration. Assuming that this is the case, it may be suggested that the following forms of contract might also be offered during the pilot scheme stage together with the normal type of cattle insurance contract.

1. Four year contract.

(a) Quarterly premium for a sum assured of Rs 48/-.

| Year | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| Premium | Rs 4/8/- | 3/- | 3/- | 1/8/- |

(b) Maximum age at entry: 6 years.

(c) An admission for of Rs 2/4/- will be payable during the first year of insurance. If not then paid, a sum of rupees 3/8/- will be deducted from the benefits payable under the policy.

2. 5 year contract.

(a) Quarterly premium for a sum assured of Rs 45/-

| Year | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| Premium | Rs 3/6/- | 2/13/- | 2/4/- | 1/11/- | 1/2/- |

(b) Maximum age at entry: 5 years.

(c) An admission fee of Rs 2/13/- will be payable during the first year of insurance. If not then paid, a sum of Rs 3/8/- will be deducted from the benefits payable under the policy.

General conditions.

1. The sum assured will not exceed one half of the value of the animal at entry.
2. Provision may be made to value the animals periodically, so as to enable moral hazard to be controlled.

3. In case of the animal dying the unpaid instalments for the policy year then current will be deducted from the benefits.
4. A suitable discontinuance benefit will be paid. This will be based on the premiums paid till the date of discontinuance, with suitable deduction for expenses incurred and the risk covered.

A further discussion of the form of contract will be possible when it is possible to have a better idea of the mortality rates prevalent among different classes of animals. The foregoing discussion is therefore intended to be only of a tentative character.

16. It may be suggested that it may be advisable to permit either the normal form of term insurance contract or a contract of the Endowment Assurance type in each centre according to local preferences. This will add to the simplicity of the working which is very desirable in this form of insurance. It may also help to eliminate such selectivity as may perhaps arise as a result of the cattle-owners who know that their animals are in bad health going in for a term insurance contract in preference to an endowment assurance contract. It may be expected, however, that the cattle-owners who take the term assurance contract would be mainly those who cannot afford to pay the higher premiums necessary for the other type of contract. Perhaps a six-year term endowment assurance contract may also be permitted provided either the survival benefit is decreased or the premiums are increased as compared with the forms of contract described above. It may be pointed out that since it is proposed to pay the benefit on the occurrence of permanent incapacity as well as death, one of the main causes of sudden depreciation in the value of the animal which gives rise to moral hazard, would be a reason for terminating the contract, so that even a longer term contract may be justified. It may be advisable, however, to limit the maximum age of insurability to 10 years in case of such an endowment assurance contract. Further, it may be provided that the benefit paid on permanent incapacity should be equal to the difference between the sum assured and the value of the incapicitated animal as ascertained by the insurer, or to the discontinuance benefit then payable, whichever is the larger amount.

## CHAPTER IV.

### Veterinary conditions in India and Cattle Insurance.

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1. The veterinary conditions in a country are of decisive importance from the point of view of the need for and workability of a scheme of Cattle Insurance. The veterinary conditions in India are at present far from satisfactory. The problem of effective control of contagious disease yet remains to be solved. The existing facilities for veterinary treatment are exceedingly limited; and the cattle-owner is too ignorant to make effective use of even such facilities as are available and is too poor to pay for them. In these circumstances it is clear that the bearing of these conditions on the workability of a scheme of Cattle Insurance deserves careful examination. Cattle Insurance must itself work as an effective means of disease-control; and in devising methods and machinery for administering Cattle Insurance the limitations of the existing conditions must be borne in mind. It is proposed to discuss this problem in some detail in the present chapter.

### Measures of control of contagious disease.

2. The problem of protection against contagious disease in epizootic form has been considered a function of the state in most western countries where elaborate legislation is available to regulate the question of contagious disease. The relevant legislation in Germany may be considered as an example. Such legislation provides, firstly, for measures of protection against contagion coming from abroad. It prohibits the import of animals attacked by a contagious disease or of those suspected or even of those which have been affected by a similar ailment; the import is also prohibited of products of such animals or of any object which may be presumed to convey the contagion virus. For the sake of preserving immunity, prohibition of live or dead animals and of products of such animals may be proclaimed either generally, or for certain frontier localities. Animals may be subjected to a medical inspection by an official veterinary surgeon

at the frontier or on arrival at a port. Further, such animals may have to remain in quarantine during a period in a depot set aside for the purpose and only after such period may be admitted into the country. Secondly, measures for combating epidemics within the country are prescribed. In addition to general measures, it may be provided that every owner of an infected or suspect animal or any person who has the care or supervision of such an animal must immediately notify the police. Veterinary surgeons, inspectors of butchers' meat, butchers etc., are also bound to make such declaration. Preventive and eliminative sanitary police measures designed to combat epidemics are prescribed. The preventive measures include veterinary inspection at the time of transport of animals, the limitation of access or even closing of markets or of shows to animal carriers of disease, etc. These measures may be of permanent type, i.e., independent of the occurrence of cases of such diseases, while the eliminative measures may be taken only on the outbreak of contagious disease and continue in force for its duration. These include, e.g., the isolation and supervision on the part of the sanitary police of infected and suspect animals, the interdict placed on the farm and even on the locality to carry on trade in the animals, the inoculation and slaughter of animals infected or suspect, the public notification of the outbreak and of the end of the epidemic, etc. In addition, special measures may be enacted in respect of specific diseases. Lastly, provision is made for compensation against losses. The slaughter of animals infected or considered as suspect in virtue of sanitary measures, the losses caused by the disease in spite of declaration made in good time or even by inoculation ordered by the police, all these will involve serious losses for the owner; and arrangements may be considered to award compensation in respect of these from the public budget.

### Control of contagious disease in India.

3. Control of livestock diseases is a much vaster problem in India than in western countries. "Rinderpest was formerly the most dreaded of all livestock scourges in Western countries. It is now non-existent. The inadequacy of the veterinary staff, the prohibitive cost of compensation, combined with prejudices against destruction of healthy animals which have

been in contact with infected ones render the adoption of western methods impracticable in India. Nor is it possible to isolate and safeguard parts of India by interposing belts of protected country between permanently infected areas and areas from which the adoption of intensive measures has succeeded in eradicating the disease. In these circumstances and for the present, rinderpest and other contagious diseases must be combated by measures designed to protect individual animals rather than by those which aim at stamping out the source of infection." An account of the various antisera, vaccines, etc., evolved for control of contagious disease may be found in 'Progress of Veterinary Research in India' by F.Ware (I.C.A.R. Miscellaneous bulletin, No.35).

In India, except for a few enactments, there are no legal sanctions for control of contagious diseases. The infection, therefore, spreads easily from one locality to another by free movements of cattle. In Central Provinces, however, quarantine stations are established under the Central Provinces Cattle Disease Act of 1934 in Saugor and Hoshangabad districts, which are placed under the control of the Director of Veterinary Services. It is understood that as a consequence of this, there has been a considerable decrease in the number of outbreaks of rinderpest in all the northern districts and Chhatisgarh division, which receive their supply of cattle through these stations. It is clear that lack of legislation for the restriction of movement of animals from and to affected areas has hampered effective control. In the absence of veterinary police regulations complete control cannot be established and attempts at control by preventive inoculation are largely nullified.

4. The veterinary departments of the various provinces carry out inoculation campaigns free of cost or at nominal cost to the owner. In South Africa and other countries, rinderpest was eliminated by killing the diseased and in- contact animals. In India, on the other hand, the system of control adopted is to raise the natural resistance of susceptible animals to the disease by the most reliable and economic methods of conferring an active and lasting immunity. The "Serum Simulateneous" method of conferring immunity against rinderpest has been successfully adopted. In this process the virus of the disease is injected into the animal at the same time as the serum is used. A mild attack of rinderpest follows. The tissues of the animal prepare their own antibodies and an immunity for several years is created. Compulsory inoculation was suggested by various bodies but has not been found necessary except in rare cases. The cultivators

are said to appreciate the value of the"Serum Simultaneous"method but the staff of the veterinary departments is unable to meet the requirements of the rural population with regard to protective inoculation. It is now also possible to immunise animals against most other contagious diseases as well.

The second important bovine malady in India is haemorrahgic septicaemia. It frequently occurs at the season of the year when the farmer most needs the services of his draught bullocks and an outbreak of the disease is considered as a great calamity.

The following information, taken from 'Agriculture and Animal Husbandry in India' for the years 1937-38 and 1938-39, may throw some light on the degree of control of the main contagious diseases so far achieved:

Rinderpest:- The methods of control were serum alone, serum simultaneous and goat adapted virus with or without serum. Of these goat virus either in the form of blood or spleen tissue was the most popular and has proved most satisfactory both for prophylaxis and for control of actual outbreaks in the less susceptible breeds. The same material combined with a suitable account of serum has found favour for the protection of buffaloes and the more susceptible breeds.

Haemorrhagic Septicaemia: This disease as far as annual mortality is concerned is of little less importance than rinderpest and despite the products available for its control no large decrease in mortality has occurred. The use of serum, serum with vaccine and vaccine alone have all been commented upon favourably as a means of controlling outbreaks, but it is evident that such control is of very local value. The factors governing the occurrence and transmission of this disease do not appear to have been examined in sufficient detail and it is clear that more accurate information is required on the real value of present methods of control. The Central Provinces report that considerable economy and great efficacy can be effected if the administration of vaccine is limited to the period just before the onset of the monsoon as the effective immunity is limited to about two and a half months.

Black-quarter: As in the case of haemorrhagic septicaemia there is little evidence that effective control has been achieved. It appears that control of outbreaks rather than their prevention is the present general objective.

Anthrax: The use of spore vaccine as a preventive inoculation has received considerable notice and is being tried in most provinces.

5. In India, the successful control of contagious diseases among cattle

is largely dependant on early discovery and prompt action on the part of the authorities and the veterinary staff. Therefore, the need for an efficient system of recording and reporting outbreaks is great. In Madras, the village munsiff reports the outbreak to tehsildar and to the veterinary assistant. This is followed by weekly progress reports until the disease subsides. It is believed, however, that the number of deaths reported is far less than the actual number; and that the deaths are wrongly classified according to cause. Attempts are made to enlist the cooperation of other departments, private bodies and popular bodies like village panchayats to improve the efficiency of reporting.

## Mortality due to contagious diseases in India.

6. Inadequate as they are, the following figures of reported deaths due to contagious diseases may help to give an idea of the relative importance of the various diseases.

During the period 1933-34 to 1937-38, the average number of reported deaths was approximately 2½ lakhs per year. Of these, the proportions accounted for by the various diseases were as follows: Rinderpest 56.6%; Haemorrhagic Septicaemia 18.5%; Black quarter 5.3%; anthrax 3.5%; others 16.1%. It will be noted that rinderpest alone accounts for more than half of the total number of deaths due to contagious disease.

The distribution of all reported deaths over the various provinces may be seen from the following figures. (Information taken from "Trend of Cattle Population in India", by H.K.Lall).

| | Madras | Bombay | Bengal | U.P. | Bihar & Orissa | C.P. & Berar |
|---|---|---|---|---|---|---|
| Average number of reported deaths during 1925-40 (thousands). | 62 | 19 | 23 | 38 | 19 | 26 |
| Percentage to bovine population in 1940. | 0.28 | 0.19 | .098 | .118 | .095 | .19 |

It must be remembered however that the actual deaths are probably several times more than those reported. Further, the efficiency of reporting in the various areas is a relevant factor.

In considering the variation of mortality from year to year, the Royal Commission of agriculture pointed out that "Rinderpest is a disease which though always present in some part of the country or other, has waves of virulence from time to time which take three or four years to reach their crest." On the other hand, mortality due to other contagious diseases remains fairly stable from year to year.

The results of an investigation into the incidence of various types of contagious disease in Madras and U.P. during the the period 1925-26 to 1939-40 are given in Appendix A(1). It is proposed to study the data relating to other provinces on the same lines.

## Bearing of Contagious Disease on Cattle Insurance.

7. The foregoing information may help to form some idea of the magnitude of the problem in Indian conditions. Next, it may be worthwhile bringing out the bearing of this problem on cattle insurance.

In foreign countries it is often possible to exclude deaths from contagious diseases from the scope of insurance protection. Even where they are not excluded the extent of such diseases is much less serious than in India as is pointed out above, and effective and speedy control is possible. Further, it is possible to secure insurance protection against losses caused by specified contagious diseases through insurance companies. Moreover, state compensation is also available in cases of many deaths from contagious diseases. Where destruction of an animal diseased or suspected of disease is required as a part of police veterinary measures, or the animal dies as a result of vaccination ordered by the authorities, compensation is usually paid by the state. It is usual to provide in the insurance contract that the insurer is not bound to pay indemnity in cases where the loss has occurred consequent on a disease, contagious or otherwise, which carries the right to compensation by public authorities, even if the insured owner has lost the right owing to infringement of the governmental provisions on the subject of contagious diseases.

In certain countries, state compensation is not confined to cases where animals are destroyed by the order of authorities or die as a result of vaccination ordered by them.

Such protection against losses due to contagious and infectious animal diseases really constitutes a separate chapter in the treatment of livestock insurance. In some countries, especially in Germany, this sort of state compensation is known as "State Insurance against epizootics" and has reached considerable importance; for example, in 1935, Germany paid

R.M.7,811,000 as compensation under this heading.

"Switzerland, also like Germany, maintains an important system of insurance against epizootics, and, again like Germany, it offers compensation for all such contagious diseases as anthrax, black leg, hydrophobia, foot-and-mouth disease, provided that the owner conscientiously carried out all the relevant veterinary regulations. The Swiss Confederation has in many cases cleverly fitted the insurance societies into the scheme for insurance against epizootics, which societies are in this way in receipt of considerable state subsidies.

"Livestock insurance in these countries is thus relieved of considerable risks, and in the case of foot-and-mouth disease has only to bear the risks of the consequent diseases, which can be kept within moderate limits by serum treatment carried out at appropriate time" (T. Vagy, Monthly Bulletin of Agricultural Economics and Sociology, 1939, pp. 418-429).

8. It is clear that the problem of meeting a large number of claims within a short period that may result from an epidemic, must constitute a serious strain on the resources of insurers of small or moderate size. This will be important especially when insurance is administered by small local societies. The only way of providing against this is either to exclude deaths from such diseases from the protection given by the policy, or to widen the base of operations and provide sufficient capital resources to take care of the period before reserves have accumulated.

A method of extending the base of operations consistently with the small size of the primary insurer that is commonly used is a scheme of re-insurance. In France, there is a three-storied organisation of livestock insurance, consisting of local societies, departmental or district funds which are the primary reinsurance institutions and national reinsurance funds which are the secondary reinsurance institutions. These secondary reinsurance funds handle special reinsurance of contagious diseases which are likely to spread over one or several provinces.

9. It is difficult to exclude contagious diseases from the insured causes without substantially reducing the attractiveness of insurance except where a scheme of state insurance against epizootics is in operation. This is particularly true in India where deaths due to contagious diseases

constitute a substantial proportion of total deaths due to all causes, and, owing to the manner of their occurrence, must be covered by insurance. The problem whether a scheme of cattle insurance could be successful without offering protection against rinderpest was debated in Burma while cattle insurance was being promoted there. In fact, a beginning was made with a type of contract under which rinderpest was excluded from insured causes; it was soon discovered, however, that no such scheme could be popular, inspite of the lower premiums possible under such a scheme. It was also argued by some that rinderpest prophylaxis must come before a scheme of Cattle Insurance. The Registrar of Cooperative Societies pointed out that the first need was to foster sound public opinion in favour of all measures capable of combating rinderpest; since cattle insurance was itself a most effective and speedy means of doing so, Cattle Insurance was a preliminary and not a sequel to prophylaxis by inoculation and the no less important prophylaxis by segregation. He also pointed out that advantage might be taken of the varying incidence of rinderpest mortality between different types of animals and different regions so as to make a beginning with cattle insurance in conditions where the effect of contagious diseases would not be too great.

### Bearing of Contagious Disease on a Pilot Scheme in India.

10. In the light of the foregoing discussion the following points may therefore be emphasised:

(a) Any scheme of Cattle insurance in India will have to provide protection against contagious diseases.

(b) One **way of** guarding against the adverse effects of such contagious diseases on the workability of a scheme of cattle insurance will be to confine insurance to areas and classes of animals which are comparatively less susceptible to attacks of such disease.

The following information about conditions in Burma will help to illustrate how this could be done:

" In the North and South zones the buffalo was till recently the principal draught beast. In the delta districts, however, the buffalos susceptibility to rinderpest has brought about an ever extending use of bullocks, and there is now an annual export of bullocks bred in the dry zone to lower Burma for ploughing and carting purposes. In the Northern wet zone, where soils are heavy and weeds strong and where cattle are also used for timber extraction, the buffalo remains in favour and the village herds are still liable to terrible epidemics of rinderpest.

"The systems of cattle tending differ widely in the wet and dry zones. In the Southern wet zone the grazing ground system is the rule. Each village has an area, generally uncultivable, allotted to it for grazing purposes, and in this area the village cattle have to pick up a precarious living. In many cases these areas are in the rains seas of mud, covered with a trampled growth of coarse muddy grasses. They provide the best possible means of spreading infectious disease and the cattle that live on them have an excellent chance of dying from disease, starvation or exposure. The mortality in such districts is very high and many cultivators regard four years as the working life of an imported beast. It is probable that a premium of 15% would not cover the risk in this part of the country. In the Northern wet zone the area of "jungle" available for grazing is as a rule much larger and there is a certain amount of segregation during grazing. Violent epidemics are unusual except for the unusually infectious disease of rinderpest. These jungles, however, contain a danger from which the southern grazing ground is free and that is wild cattle - bison, deer and pigs from which anthrax and other diseases are undoubtedly communicated to tame cattle. If insurance be ever extended to the northern districts a high rate of premium will be necessary. In the dry zone districts the custom is that draught cattle which are almost entirely bullocks, are stall-fed while cows and calves are grazed in herds in scrub jungle near the villages. The stall-fed draught cattle are carefully fed and housed and seldom suffer from epidemics. The breeding herds are tended with much less care and suffer from scanty fare, bad housing and dirty pens. In a season of drought the cows and calves die in large numbers. Disease also kills them off in quantities. Except in a few restricted areas cows are not used by the Burmese for milking purposes and it is somewhat surprising that with the treatment they get they produce such good draught stock.

"In view of the above conditions it was obvious that the first experiments in insurance must be restricted to draught cattle and to such cattle only in selected dry zone districts where the stall-feeding and careful tending of such animals was the rule".

(International Review of Agricultural Economics, Vol.LXXIV, 1917)

The following information taken from an official pamphlet describing conditions in Bombay Province may also be found useful in this connection:

Rinderpest: This disease kills about half the cattle which it attacks in the plains and nearly all in the hills. Therefore, in hilly tracts either cattle insurance should not be started, or they should exclude death by this disease from the risks insured against. Where it is common, young cattle die from it more usually than old ones, and it might be well to raise the minimum age for insurance and to insist on preventive inoculation as soon as the disease appears in the village.

Haemorrhagic septicaemia:- This disease usually attacks buffaloes, and it would be prudent to exclude them altogether from societies in Northern Gujarat and other places where the disease is common. The best way to stop its spreading is to clean the byres of the cattle thoroughly every day and to provide them clean water to drink.

Anthrax:- Occurs principally in the Karnatic and kills about 90% of the cattle attacked by it. It is not common among buffaloes. It can be checked by cleanliness and preventive inoculation.

Black-quarter:- Attacks chiefly young animals upto four years of age. Adult animals are not so susceptible except in a few notorious places and may be protected by vaccination.

Similar information relating to conditions in Madras and U.P. will be found in Appendix A.(1)

It will be clear from the above that the effect of the contagious disease on the fortunes of a Cattle Insurance Scheme could be minimised to a considerable extent by selecting suitably the areas for operation of the scheme, the class of animals to be insured and the age intervals during which they are insured.

(c) Another important method of achieving this end will be to avail of the control by preventive inoculation. As pointed out above a considerable degree of control is now possible.

One way of achieving this would be to give a substantial rebate on premiums in case the insured animal is protected against contagious diseases so that the owner himself may arrange to have the animal protected. The Madras bye-laws for Cooperative Cattle Insurance Societies provide that a rebate of 3 pies per rupee on the sum insured will be allowed on all animals protected against rinderpest by the "Serum Simultaneous" method. The substantial reduction in the premium resulting from this rule will be appreciated when it is remembered that in case of castrated male animals the premium contemplated by the rules was only 9 pies per rupee on the sum insured. In the absence of suitable statistics it will be doubtful, however, if a rebate of this extent is justified by the more favourable mortality experience in case of animals so protected.

It is suggested that a more satisfactory procedure would be to insist on regular and compulsory protection of the insured animals, against rinderpest by the "Serum Simultaneous" method in all cases and against anthrax, haemorrhaegic septicaemia and black quarter at least in those tracts where these diseases are of most common occurence. Introduction of a rule of this nature in the bye-laws of the cattle insurance societies in Bombay was at one time being considered. Further, it will be advisible to provide that no fees of any kind, such as a charge for the inoculation serum, may be charged by the veterinary officers in respect of inoculations of the insured animals, whatever the general practice of the department in this respect. Even if Cattle Insurance is administered by private societies, free veterinary services in this form may be considered as a legitimate and necessary form of state aid to such societies. It may be remembered that such aid will promote the general objectives which the veterinary departments have in view.

(d) As may be expected, considerable attention is paid in the byelaws of the various Cattle Insurance Societies to laying down measures to be adopted in case of an outbreak of contagious disease. For example, the Punjab bye-laws, lay down that no indemnity will be payable on account of animals dying of contagious diseases, such as Haemorrhagic septicaemia, black quarter, foot-and-mouth disease and rinderpest, where the member has failed to carry out the rules regarding sanitation promulgated by the Committee with the sanction of the Veterinary Department, or to inform the Committee of the outbreak, or to inoculate his animals when required by the Veterinary Department before the beginning of the season of the contagious diseases. The corresponding rule in Madras bye-laws runs as follows: "In the case of any contagious disease occurring among animals belonging to a member, whether it has been insured or not, he shall at once inform the Board of Directors and segregate the diseased cattle, whether insured or not. The Board of Directors shall report the occurrence to the Veterinary Assistant and secure his services to deal with the disease promptly. The member shall be bound to have his cattle, whether insured or not, inoculated if he is so advised by the Veterinary Assistant. If he fails to do so no indemnity will be paid." In explanatory paragraphs attached to the Bye-laws in Bombay, it is stated that "the Superintendent, Civil Veterinary Department, has kindly promised to direct his staff to keep a special watch over Cattle Insurance Societies. It is intended for the first few years that veterinary graduates, where they will accept the post, should be invited to be the Honorary Chairmen of the Societies." It is pointed out that without the help of a veterinary graduate the causes of death will be wrongly diagnosed by the Committee members and the proper measures on the appearance of an epidemic may be neglected with disastrous results to the Society.

It will be seen from the nature of the foregoing provisions that there is much to be said, so far as this aspect of the problem is concerned, for management of Cattle Insurance by the Government through the staff of the Veterinary Department, provided a representative of such staff is available within easy access to receive reports of disease and to inspect and check that the measures prescribed are carried out. It may be expected that outbreaks of epidemics will be more promptly and effectively attended to if this is made a part of the normal functions of the veterinary officers in a direct manner, and the possibility of a direct financial loss to Government in case of negligence is always present in their minds, instead of their help being sought through the intermediate agency of the Managing Committee of the Society.

### Veterinary Facilities in connection with Cattle Insurance in India.

11. It may be also useful at this stage to review the position as regards the available facilities of veterinary assistance in rural areas in India. The Royal Commission on Agriculture pointed out the need for two types of veterinary officer. The main work of a state veterinary service should be the control of contagious diseases disastrous to the whole community in

their economic effects and in some cases dangerous to human health. Recognition of this has led to the employment of state veterinary surgeons remunerated from public funds in most civilised countries. As against this, there is the type of officer who merely protects the interests of the owners of livestock - the Veterinary Assistant in India or the private practitioner in western countries. In India, "in existing conditions, private veterinary practitioners cannot earn a livelihood in rural areas. Unless, therefore, government or district boards take the initiative veterinary aid is beyond the reach of rural community. Moreover, quite apart from the consideration that it should be repugnant to public opinion to permit preventible suffering in domestic animals, it cannot, we think, be disputed that where the community consists to so large an extent of cultivators who, individually, are too poor to secure the benefits which modern veterinary medicine can confer, local bodies as trustees of the welfare of the public whom they serve should devote a part of the fund at their disposal to the provision of veterinary assistance."

One of the features of the present situation in India which must be taken into account is therefore the absence of the private veterinary practitioner. In foreign countries the help of the private veterinary practitioner is insisted on for various important functions in connection with Cattle Insurance. In India, while such technical help is equally indispensable for the working of cattle insurance, it is necessary to provide this through the agencies of the Veterinary Departments. Moreover, such help may have to be given free or at nominal cost. This is desirable since it is one of the accepted objectives of the veterinary department in India to educate the cattle owner into seeing the wisdom of availing of the benefits of veterinary medicine. Lastly, the size of the field agencies of the Veterinary Departments is at present limited; but on the other hand, it is necessary for successful working of cattle insurance that speedy and easy access to such agencies should be possible. It is desirable therefore that, whatever, be the form of the organisation evolved for administration of Cattle Insurance, veterinary assistance may have to be provided by Government free of cost or at nominal cost and this should be looked upon as part of the normal functions of the veterinary departments.

12. In foreign countries, in connection with the working of cattle insurance, the assistance of a veterinary surgeon is demanded to perform certain essential functions:

In every case of mortality insurance the animal is examined by a veterinary doctor and a report given containing the name of the animal, age, breed, hire and marks of identification, etc., and a medical questionnaire including information about eye-sight, pulse and respiration, legs and feet, attacks from colic, any previous operations and its effects, etc.

In the event of sickness or injury of any animal the insured must at once secure at his own expense the services of a veterinarian to attend the animal. He must also give notice to the insurer of such sickness or injury by a telegram or telephone. This should include among other details the name and address of the veterinarian who attended.

Before a claim is considered the last attending veterinarian's certificate is always necessary. If the animal is found dead or died from an unknown cause, the assured should at once have a postmortem examination made at his own expense by a veterinarian in order to determine the cause of death, and immediately furnish the insurer with a complete report of the veterinarian's findings in connection with the postmortem.

The provisions made in respect of these functions in the model bye-laws of the Cattle Insurance Societies may be studied in this connection. In Madras, a certificate of health and value by the Veterinary Assistant must be submitted at the time of insurance at the cost of the insured. In the Punjab the Valuation Committee includes the Veterinary Assistant. It would appear, therefore, that the insured does not bear the cost of veterinary examination. In Bombay and U.P., the Committees satisfy themselves about the health of the animal without technical advice. In case of ill-health of an insured animal, it is usual to demand immediate intimation to the Committee. The Committee may then instruct that veterinary help may be sought and the insured has to carry out the instructions apparently at his own cost. In Bombay it is specifically laid down that if any charges are made in this respect by the officers of the veterinary department, they will be shared equally between the society and the insured. The Managing Committee is to see that the insured animals are properly tended, housed and kept under proper sanitary conditions and to supervise their treatment. In case of outbreak of contagious diseases, immediate reports are made to the Veterinary Assistant through the Committee and the advice of the Veterinary Assistant as regards inoculations, etc., obtained and followed. Rules of sanitation may be framed in cooperation of the veterinary department which will have to be carried out by members. In case of a claim it is only in the Punjab that the report of the death of the Committee is required to be attested by a Veterinary Assistant as well as by two members of the Managing Committee. In other provinces it suffices to get death vouched for by members of the Committees, and to have the carcass inspected.

It will be seen, therefore, that while the need for assistance of a veterinary surgeon is appreciated, an attempt is made to reduce it to a minimum and the Committees of management and valuation are assigned functions that in other countries would need the assistance of a veterinary surgeon. It is necessary therefore that the members of the Committee must have considerable experience of veterinary matters. Secondly, the question of meeting the cost of treatment has to be faced and in Indian conditions too much emphasis on veterinary treatment at the insured's own cost would certainly limit the popularity of insurance. It is clear therefore that offer of expert veterinary advice free of cost to the insured may be considered to be one of the conditions that will help considerably the success of the scheme. This may be done by instructing the veterinary officers to pay particular attention to the needs of the Cattle Insurance Societies. But perhaps a more efficient way which will ensure speedy and adequate assistance would be to manage cattle insurance through the Veterinary Departments concerned. This may be desirable at least during the pilot scheme stage.

### Extent of Field Agencies of the Provincial Veterinary Departments.

14. The question that will need to be considered at this stage would be whether the present field agencies of the Veterinary Departments are sufficiently extensive and well-developed to permit their undertaking this

kind of work. As indicated above the veterinary treatment is provided mainly by Veterinary Assistants employed in the Veterinary Departments of the various provinces. In addition to these, an attempt is being made during recent years to extend the field services of the Veterinary Departments by appointment of lower field staff such as stockmen or stock-supervisors or Livestock Inspectors who may be given training for small periods of from six months to two years and placed in charge of a certain number of villages. These services are yet in the process of being extended and the pace at which they could expand is perhaps determined by the number trained every year.

An idea of the present position in this connection may be obtained from the following information about the field staff of the Veterinary Departments of the various provinces.

The conditions in Madras may be seen from the following:

"Through its various Veterinary dispensaries and itinerating veterinary assistant surgeons, the department renders medical aid to such of the cattle as are attacked by diseases or are otherwise rendered unfit for work. Veterinary hospitals and dispensaries have been established in all the headquarter towns of the districts and in most of the taluk headquarters. There are 135 Veterinary Institutions in the province and annually over 3 lakhs in and out-patients are treated in these institutions. The itinerating veterinary assistant surgeons who number 165 also assist in the treatment of cattle and animals in rural areas and they handle about 1½ lakhs of cases annually. Their jurisdiction extends normally to one taluk and they attend to the outbreaks of contagious diseases, castration of animals, treat minor ailments of cattle, organise cattle shows and advise the ryots on all livestock matters.

"The Royal Commission on Agriculture, 1928, was of opinion that the aim should be to provide on an average at least one veterinary assistant surgeon for every 25,000 cattle. On this basis, the total number of veterinary assistant surgeons required for the Province of Madras is 880 but there are now only 300 veterinary assistant surgeons. The jurisdictions of many of the veterinary assistants extending as it does to two or more taluks is too large. The number of veterinary hospitals and dispensaries is not adequate. Many of them are located in district headquarters or in other towns and the ryots of interior villages are not able to avail of the facilities offered by them." (Rural Problems in Madras, by S.Y.Krishnaswamy, 1947, p.221). There are 25 District Veterinary officers in Madras.

A two years' course intended to train men in Animal Husbandry matters so as to get a sufficient number of trained personnel for Livestock and Veterinary work in the villages of the Madras Province was introduced in July, 1948. The subjects taught include anatomy, physiology, animal husbandry, Materia Medica and Pharmacy, general and minor surgery and preventive medicine. Only persons who have completed the School Leaving Certificate are admitted to the course, and after training they are eligible to appointment as Livestock Inspectors in the Civil Veterinary Department, Madras, in the grade of Rs 60-3-120. 75 candidates were admitted to the course in 1948.

In the East Punjab, there are 205 Veterinary Assistant Surgeons and 48 stock assistants. The jurisdiction of the Veterinary Assistants extends approximately from 100 to 150 villages. The stock assistants receive training for a period of six months at the Livestock Farm at Hissar. It may be remembered that East Punjab is divided in 13 districts, 35 taluks and 223 Revenue Inspector's Circles.

In Bihar, there are 16 Veterinary Inspectors each in charge of a district though some are in charge of two or parts of two districts. In the province there are 34 Veterinary Hospitals, 119 Veterinary dispensaries all in charge of a qualified Veterinary Assistant Surgeon. The Veterinary Assistant Surgeons in charge of dispensaries have to tour from 15 to 20 days in a month to attend to outbreaks of cattle disease and treat cases. Each also attends 2, some only 1, of field veterinary dispensaries, which are miniature country dispensaries to be attended only once. The area and cattle population in charge of each Touring Veterinary Assistant Surgeon is nearly 583 square miles and 119000 heads of Cattle. There are no stockmen in the department at present. In the postwar development scheme there is gradually to be one Veterinary Assistant Surgeon for 2 thanas in course of 5 years and each will have about 311 sq. miles to cover and about 64,000 heads of Cattle to look after.

In Orissa, there are six District Animal Husbandry and Veterinary officers each in charge of 2 districts. Each of these officers is assisted by a senior Veterinary Assistant Surgeon designated as District Animal Husbandry and Veterinary Inspector. Ordinarily a Veterinary Assistant Surgeon is placed in charge of one revenue division and one stockman is placed in charge of one police station. The total number of Veterinary Assistant Surgeons in the old districts is 37 and 19 in ex-state areas. Besides these there are 3 temporary posts of Veterinary Assistant Surgeons sanctioned for the propaganda and milk supply scheme. The total number of posts of stockmen in the old districts including 40 temporary posts is 103 and 52 in the ex-state areas. In addition there are a few other posts of stockmen sanctioned for the farms, propaganda schemes, sheep and goat farms, etc. Ordinarily officers who have not got any training are designated fieldmen. The course of training of the stockmen covers a period of about a year including a period of 4 months spent on practical training in the field. The critical portion of the training includes lessons on Animal Husbandry and disease. Trainees are also taught Cattle, Sheep, goats and poultry husbandry and about various aspects of pasture improvement, fodder growing, etc.

In Bombay, in 1944-45, there were 133 Veterinary Institutions and there were 162 Veterinary Assistant Surgeons employed in the subordinate veterinary services. There is also a cadre of stockmen in the province in which there were at the end of that year, 35 persons employed and 17 vacancies. Bombay Province comprised 20 districts and 171 taluqs. Training in Stockman's course for a period of 12 months was started at the Bombay Veterinary College in 1946, and the first batch of 54 was admitted to the course in March, 1946.

In U.P., the field staff consists of 27 livestock officers, 8 veterinary inspectors, 253 veterinary assistant surgeons and 493 stockmen. In addition, there are 6 veterinary assistant surgeons and 2 stockmen at the headquarters. There are 49 districts and 210 tehsils in U.P. The Animal Husbandry department runs courses of six month's duration for training stockmen, one at Lucknow and the other at Bharari, Madhurikund and Babugarh. In 1946-47, 87 stockmen were trained and 67 were under training at the end of the year. The curriculum for the course of training at Lucknow includes elementary anatomy and physiology, veterinary medicine and surgery (contagious and non-contagious diseases and their treatment; uses and compounding of common drugs; care of drugs, instruments, appliances, etc., used in veterinary practice; sterilisation and disinfection of cattle sheds, railway trucks, etc., care and feeding of sick animals); and animal husbandry of poultry.

In C.P. & Berar, during 1940-41 there were 145 Veterinary Assistants, of whom 105 were occupied in dispensaries and 28 in touring. There are 82 Tahsils in the province.

15. It will be seen from the foregoing information that the provincial veterinary field agencies are not at present extensive enough to provide the necessary administrative field machinery for providing veterinary treatment in connection with a scheme of Cattle Insurance.

It may be remembered, nevertheless, that in the immediate future it is proposed to confine Cattle Insurance only to limited areas and, therefore, the number of field staff required for this purpose may not be large. Perhaps, an officer with veterinary qualifications and experience could be put in charge of the operations of the scheme in each province; it will be possible to entrust a good deal of the field work to stockmen or stock-supervisors put in charge of a small number of villages such as 20 or 25 and this could be done perhaps by supplementing the existing field staff of the veterinary departments. These may be assigned the normal work of the department in addition to the Cattle Insurance work.

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# CHAPTER V

## ORGANISATIONAL SET-UP FOR A SCHEME OF CATTLE INSURANCE

## TYPES OF CATTLE INSURANCE ORGANISATIONS

1. Livestock insurance is administered by organisations of a wide variety of forms. It is administered by joint-stock companies and also by organisations of different forms established on principles of cooperation and mutuality. A classification of different types of organisation has been attempted by Mr. N. Baron in his book on Cooperative Insurance. Some of these types may be briefly mentioned here.

We may first mention agricultural general cooperative insurance societies which cover different classes of rural insurance including livestock insurance for the whole country. These may be classified as follows: (i) Primary cooperative societies formed by individual members, like the Agricultural Cooperative Insurance Society, Ltd., in Great Britain and the Farmers' Cooperative Insurance Society (Gazdak), which is the largest and most important cooperative society in Hungary. The Gazdak receives no grant or subsidy from the State but the latter participates in the share capital. (ii) The secondary societies formed by local societies and their members in Baltic countries. "Their experience shows that it is possible by means of proper legislative and organisational measures to build up a unified system of cooperative insurance for the whole country and to reorganise the mutual insurance and sound cooperative lines;" (iii) Mutual Societies or limited companies formed by the central farmers' unions. The National Farmers Union Mutual Insurance Society, Ltd., subscribes insurance for members of the National Farmers Unions of England and of Scotland and the Ulster Farmers Union; (iv) Cooperative organisation under state monopoly in U.S.S.R. and Ukraine. The Coopstrach in Ukraine was entitled to carry out all kinds of insurance of property belonging to cooperative organisations. The membership consisted of cooperative organisations of all kinds and all degrees. The Coopstrach conducts fire and livestock insurance on its own and also acts as agent for State Insurance Board in livestock and hail insurance and transport and fire insurance.

Second, the State aided National Systems of Livestock Insurance in France and Italy may be mentioned. The French System is the most characteristic of this type. The mutual societies in operation in France have been organised under the legislation passed in 1900 and they receive considerable support from the state. The local societies are grouped into regional reinsurance unions and these in turn are federated in central reinsurance societies. There are two main groups of organisations, Caisses Nationales de Reassurance and the Caisses Centrales de la Mutualite Agricole. The livestock and fire mutual insurance Societies may obtain from the Ministry of Agriculture grants of two kinds: (a) foundation grants made to societies in course of formation to enable them to meet initial expenses of organisation and to build up a preliminary reserve fund; (b) grants for losses incurred made to societies in full working order which have suffered unusual losses during previous years.

Thirdly, there are also special agricultural cooperative and mutual societies conducting livestock insurance only, in most European countries. These may operate on their own, without state aid, as in Belgium,Denmark, England, Holland, Czechoslovakia, Hungary, and Finland; or under the supervision and with the assistance of state as in France, Bulgaria, Italy and Switzerland.

In India attempts were made to organise Cattle Insurance through cooperative societies in Madras, Bombay, Coorg, U.P. and the Punjab. It did not however make any considerable headway except to some extent in Coorg. However, at one time Cattle Insurance had reached a fairly advanced stage in Burma where there were about 400 societies with 6000 members and those societies were federated into a reinsurance union.

## SUITABLE ORGANISATION FOR CATTLE INSURANCE IN INDIAN CONDITIONS

2. In India, in considering a suitable organisation for operating Cattle insurance we need for the present consider three alternative forms. The private insurance company, the cooperative society with or without state-aid and a completely state-managed scheme. It will also be useful to consider the pilot scheme stage separately from the ultimate stage into which the scheme may develop.

3. It seems unlikely that private companies will in the present conditions be willing to set up the necessary field services in the rural areas to perform the necessary functions in connection with Cattle Insurance. In fact, as pointed out earlier, the necessary veterinary personnel may not be available to them unless they can count upon the government agencies. Also, in view of the probable degree of participation, it may be doubted if the cost of such organisation will not be prohibitive for a private insurer. The participation of a private company in a scheme of this kind may therefore be largely by providing facilities of reinsurance to primary societies. Even here, however, a company may find the idea more attractive after some data on which to calculate premia are made available as a result of investigations in several areas and as a result of the operation of the pilot scheme. The possibility of reinsuring risks through private companies may however be borne in mind.

4. The immediate alternatives may therefore be considered to be a scheme administered by cooperative societies with state help and one administered by government entirely.

The advantages of a cooperative society as a primary insurer for Cattle Insurance arise from the nature of the contract. The main advantage is that the members of a small society are in a position to exercise close supervision over the insured animals, to see that they are kept in proper sanitary conditions and that no attempt is made by any individual member to gain any unfair advantage over the society, and to take promptaction when need arises for it. They are also in an advantageous position for determining the value of the animal and for identifying it; and as a result of such close supervision, the claim rate should be low. Secondly, the services of local persons of standing may be secured free of cost for carrying out most functions connected with administration and the expenses of administration will be very much lower. This is an important consideration. Thirdly, it is also clear that the educative value of a scheme administered on cooperative lines is likely to prove much greater and genuine cooperation by local people in campaigns of control of disease may be made easier as a result of the existence of such societies.

Another aspect of the matter that was stressed when development of Cattle Insurance in Burma was being contemplated was the intimate connection between the work of Cattle Insurance Societies and the cooperative credit societies. It was pointed out that the credit obtained from credit societies is largely used to replace cattle dead of diseases that ought to be to a large extent preventible and, in as much as it is better to save a beast than to replace it, insurance should rightly precede or at any rate accompany a credit system; and that until cattle insurance was provided credit societies would be treating only a symptom and not the main malady. The effectiveness of a cattle insurance society in creating essential public opinion in favour of sanitation was stressed. It was also pointed out that insured cattle are to the extent of insurance good security for loans. Cattle Insurance, therefore, was developed in close connection with the credit society. It was in fact decided that in the five districts to which operations were to be confined every credit society should form an annexed cattle insurance society and that for purposes of supervision a cattle insurance society should be admitted into the union to which the credit society, to which it was annexed, belonged.

It would seem clear, therefore, that there are strong considerations in favour of cattle Insurance being administered through cooperative societies. There are however certain drawbacks in this form of organisation, which will have to be considered carefully.

However, before proceeding to discuss this question further, it may be worthwhile to present a picture of the working of a cattle insurance society in India as seen in the model byelaws prepared in the various provinces.

### Working of a Cattle Insurance Society in India.

5. A group of cattle owners desiring to form a Cattle Insurance Society may meet informally, adopt a set of byelaws on the lines of the model byelaws with suitable modifications to meet local conditions, and apply to the Registrar of Cooperative Societies in a suitable form for registration. In Bombay it is necessary that the organisers own not less than 100 cattle.

The Society may have a share capital and each member may have to to be a shareholder. In Madras, the byelaws provide for a share capital of Rs.500 made up of 500 shares of Re. 1 each. Each member has to buy at least one share and cannot insure more than one animal in respect of each share owned by him. No member can own more than ten shares. The liability of members is limited to the share capital subscribed by them. In other cases, there may be no share capital and the liability of members may be confined to payment of premiums payable under the policy. However, a small entrance fee such as Re.1/- may be charged. There may also be further restrictions on membership, such as, that only members of cooperative credit societies can be members. The applications for membership are to be approved by the Managing Committee.

In U.P., it is provided that a member must belong to a Society for at least a year, and for three years after he receives an indemnity. The latter part of the rule probably owes its origin to the feeling that it is unfair for a member who has received an indemnity from the Society to withdraw from the Society and refuse to contribute to its future liabilities.

The ultimate authority in all matters relating to administration rests with the General Body which may meet at least a prescribed number of times in a year. The General Body would review the working of the Society, modify premium rates, if necessary, with the sanction of the Registrar of Cooperative Societies, appoint committees entrusted with the actual working of the scheme, hear complaints about Committees and office bearers, consider the Audit Note and any suggestions by the Registrar, or any suggestions by the members, etc.

Generally, the administration is carried out by two Committees, a Managing Committee and a Valuation Committee.

The Managing Committee consists of from 5 to 9 members elected by the General Body. The members serve in an honorary capacity, except the Secretary who may be remunerated with a salary and/or a part of the profits as bonus. The Managing Committee admits new members; accepts applications for insurance; processes claims; receives premia; verifies cash balances and prepares Balance Sheets; sees that the insured animals are properly housed, tended and fed and in particular gives instructions for their treatment in case of ill-health in cooperation with and with the help of the officers of the Veterinary Department; it arranges for marking of insured animals for facility of identification and for remuneration of the markers.

The Valuation Committee generally consits of three expert cattle-owners and is appointed by the General Body. In the Punjab the Veterinary Assistant is a member. The Committee verifies the age of the cattle and values them and sees that they satisfy the conditions of eligibility. Members may also be assigned other functions demanding expert knowledge of cattle. They may inspect animals to see that they are not being ill-treated or neglected; they may see that any sanitary rules laid down by the Managing Committee were being carried out. They may inspect the carcass on the death of an insured animal and certify death. The Valuation Committee does not value animals owned by its members.

The society keeps the necessary books, such as, a register of members, a ledger account for each member containing details of all insured cattle owned by him, their values and the premiums paid; and a Minute Book showing the proceedings of the meetings of the Committee and of the general body.

There are generally two funds, a General Fund to which are carried the current receipts and a Reserve Fund.

6. The operating procedure in respect of a Cattle Insurance policy would be as follows:

With the application for insurance each member furnishes a list of his cattle proposed to be insured, and states their ages and general description and the value he puts on each. The Valuation Committee then inspect the animals and satisfy themselves that they are in sound health, kept in sanitary conditions and otherwise eligible for insurance; and fix their ages and values. The owner is required to give them full information and wilful suppression of material information invalidates the contract. In Madras where there is no provision for a Valuation Committee, a certificate of a Veterinary Assistant at the owner's cost has to be produced. The Valuation Committee reports to the Managing Committee. If accepted for insurance, arrangements would be made to mark the insured animal, e.g., by branding it with the society's mark on the right foreleg. Animals would be revalued at intervals of a half-year or a year.

As pointed out earlier only animals of certain classes and within certain age-limits are insured. The indemnity payable on death is equal to a fraction of the value of the animal as ascertained at the valuation previous to death.

Arrangement may be made for inspection of animals to see that they were not being ill-treated or neglected.

In case of ill-health of insured animals the owner is bound to inform the Managing Committee immediately and carry out their suggestions for treatment. In case of an outbreak of contagious disease, the owner is bound to inform the Committee, and segregate the animals whether insured or not. The Board would report to the Veterinary Officers and secure his prompt attention and the owner is bound to carry out all their instructions .

On the loss of an animal, the occurrence would be immediately reported to the Managing Committee with full details as to hour, place and cause. The owner would produce the carcass and get the death vouched by members of Valuation Committee or Managing Committee. Attestation by a Veterinary Assistant may also be demanded.

The hide and carcass of the insured animal may belong to the society who may help in its disposal at good price.

The amount of the indemnity is normally paid at the next meeting of the general body.

7. It may happen that during a particular period, the premium income and other receipts of the society may exceed or fall short of the outgo by way of indemnities and expenses. The rules of the society must provide for meeting each of these contingencies.

Societies, as pointed out above, generally provide for setting up a Reserve Fund to which is carried the excess of receipts over expenditure in any year as declared by the Registrar of Cooperative Societies. To the reserve fund may also be carried miscellaneous receipts such as fines, entrance fees, interest on investments, etc. It is provided that the Reserve Fund belongs to the Society and is not divisible among members. The Reserve Fund may be available with the sanction of the Registrar for payment of indemnities and expenses which cannot be met out of the General Fund. Further restrictions may also be prescribed as to the maximum extent to which the reserve fund could be drawn upon to meet the outgo in respect of a given period. On the dissolution of the Society the Reserve Fund may be applied to such purposes as may be determined by the majority of members with the approval of the Registrar.

It will be seen that generally no provision is made for distribution among members of a part of the reserve fund when it exceeds a certain sum, directly as cash bonus or dividend or by way of increase of benefits or reduction of premiums. However, the Bye Laws for Madras visualise distribution of a part of the net profit whenever such profits accrue. It is provided that out of the net profits of the society as declared by the Registrar, only 25% are to be carried to the reserve fund and 10% may be paid as honorarium to the Secretary. The balance of 65% is to be utilised, first, for payment of a dividend on share capital at a rate not exceeding 6¼%. If any balance is still left, it is to be used for various purposes in a prescribed manner, including a quarter of such balance to be used to allow renewal rebates on premiums.

It may happen that the General Fund as well as the Reserve Fund may together be insufficient to pay the indemnities which become payable during a given period. The contingency can be faced in various ways:

(a) The necessary funds or a part thereof may be raised by a special levy made on the members of the Society. Sometimes a maximum limit is prescribed to the levy that can be made during any given period; e.g., the amount of the levy may not exceed the premium paid.

(b) The deficiency may be wiped off by reducing the indemnities payable during the period proportionately.

(c) The deficiency may be met from the money obtained from a reinsurance company. For example, a fraction of the risk in case of each policy may be reinsured; in this case the society will have to provide for deficiency in respect of the other half only. Under certain forms of reinsurance, the reinsuring body may make good the entire losses exceeding a certain proportion of the income; or the entire loss due to a particular cause such as contagious disease may be paid by the reinsuring body.

(d) The deficiency may be met from subsidies from the state, and from donations from charitable persons and institutions and members, etc.

8. In case of Cattle Insurance Societies in India no byelaws provide for an additional levy being made on the members. In U.P. and the Punjab,

provision is made for reinsuring a part of the risk, such as one half, with a joint stock company or with a cooperative reinsurance society, subject to the approval of the Registrar. The general method of meeting deficits visualised in the byelaws is therefore the reduction of benefits payable during the period of excess claims. Sometimes grants from government and other sources are also visualised.

## CAUSES OF FAILURE OF CATTLE INSURANCE SCHEMES IN INDIA

9. As pointed out earlier, attempts at promoting Cattle Insurance have been made in different provinces in India but they did not meet with remarkable success anywhere except to some extent and for some time in Coorg. It will be, therefore, worth while analysing the reasons which came in the way of the success of the schemes. No light on this subject can be found in the reports of the Registrars of the Cooperative Societies except for general statements such as the following:

" This form of organisation has never yet been appreciated by the people. They fail to understand its advantages and are loath to give up their old practices."

A more detailed analysis was however provided in the report of a Committee. appointed in 1923 by the Gujarat Branch of the Provincial Cooperative Institute in Bombay, to enquire into the constitution and working of Cattle Insurance Societies and to suggest steps to be taken for their development. This Committee drew attention to various features of the Cattle Insurance scheme in Bombay which came in the way of its success and these may perhaps be considered as typical of such attempts in other provinces as well. These were as follows:

1. Lack of adequate and effective propaganda to combat the general tendency to fatalism on the part of the cattle-owner prevented insurance being popular.
2. The rate of premium was considered too high by the insured.
3. The nature of the Cattle Insurance contract, which was merely a term insurance, had certain drawbacks. If a cultivator insured an animal during the entire period in which it could be insured, he might pay a sum equal to 40% of its value and yet if the animal survived, as a majority of animals would, get back nothing tangible in return. Moreover, on reaching the

maximum age beyond which insurance was not permitted, the animal would no longer be protected by insurance.

4. It was stated that the shrewd agriculturist could foresee the difficulties that might arise in case the funds of the society in any year did not suffice to meet the claims arising during the year, as might easily happen, e.g., in case of an outbreak of an epidemic.

## REMEDIAL MEASURES

10. It will be useful at this stage to discuss these features in some details with a view to see how and to what extent they can be modified so as to ensure the success of a Cattle Insurance scheme managed through Co-operative Societies.

### (a) Effective Publicity and Propaganda

11. The need for educating the agriculturists in seeing the benefit of timely thrift in the form of insurance is generally admitted. Perhaps the most effective means of such education would be to work a scheme of insurance and to demonstrate the benefits which it can bring. However, in this respect it would be useful if in selecting areas for operation of the pilot scheme care is taken to choose those areas where the cultivator is comparatively better educated and more progressive in his outlook and where cattle have a good value. It is clear that in such areas the benefits of insurance may be appreciated comparatively more easily. Further, having selected suitable areas, an intensive campaign of publicity and propaganda through official and non-official agencies will have to be undertaken. The Committee referred to above remarked as follows in connection with this point:

" The first need appears to be that of systematic, vigorous and well-organised propaganda. At present there is practically no literature on Cattle Insurance in Gujarati except a leaflet published by the Cooperative Department. It is very necessary that readable literature in handy leaflet or book form should be published and distributed at suitable centres on a liberal scale. This we believe the Institute ought to be able to do. Every official and non-official field worker of the Cooperative and Agricultural Department and of the Institute, Central banks and Unions should be supplied with sufficient literature of this nature and should be instructed to explain the benefits of Cattle

Insurance on every opportune occasion. If these were done we are sure that the class of cultivators in Gujarat-especially North Gujarat- who value their cattle highly and who are otherwise fairly progressive and open-minded, will respond to the efforts of the workers."

It will be clear that considerable attention will have to be paid during the pilot scheme stage to this aspect of the problem. From this point of view it will be desirable to put fulltime officers in charge of the working of the scheme in each province.

(b) Premiums based on results of mortality investigations

12. As regards the size of the premium, it may be remembered that this will of course have to depend on the rates of mortality prevalent among the classes of insured animals in the areas of operation of the scheme. The actual premium charged by the Cattle Insurance Societies which were started in India were not based on any systematic investigations into mortality. No opinion about the adequacy of the rates of premia could be expressed except in a broad manner unless such a preliminary analysis of data is made or until information on this point becomes available as a result of the working of the scheme of Cattle Insurance on an adequate scale for a period of years.

Another sense in which premiums may be said to be too heavy for success of the scheme, is in relation to the ability of the cattle-owner to pay the insurance premiums. The poverty of the average cattle owner in India is well-known. But it may be remembered that the insurance premium is not necessarily an additional item of cost in the farmer's budget. Many of the cattle owners who lose their animals by disease or accident have to replase them by borrowing at exhorbitant rates of interest much larger sums than the amounts of premiums they are likely to pay, since such cattle-owners will have to bear the risk entirely on their own. Where the owners cooperate under a Cattle Insurance scheme, those who have the misfortune of losing their animals are subsidised to some extent by those whose animals survive. While each cattle-owner buys security against the contingency of sudden loss of animals, those who actually incur the losses do not have to bear the full burden of such losses. Again, it may be remembered that the premiums can be reduced by reducing benefits proportionately so as to bring them within the means of the insured. It should be possible therefore with adequate propaganda to make the farmer see the advantages of Cattle Insurance and the wisdom of paying the premium. It may be desirable, nevertheless, to subsidise the scheme to a certain extent in the initial stages so as to make Cattle Insurance more attractive. The subsidy may be limited to payment of the expenses of management in the early stages and gift of free veterinary services. It has been suggested that a larger subsidy covering a substantial proportion of the cost of the basic risk may be advisable in the initial stages so that the folly of keeping out of the scheme should be obvious to the cattle-owners. It may turn out, however, that such a subsidy once given may be difficult to withdraw.

It may be suggested, therefore, that from the point of view of charging the minimum premiums necessary consistent with safety, it will be desirable to undertake investigations into the mortality of different classes of animals before the scheme is started. This question has been discussed at some length in Chapter VI. It may be pointed out that even in other countries Cattle Insurance has been started without a precise idea of basic mortality rates, but this procedure may introduce certain elements in the working of the scheme which may come in the way of its popularity in Indian conditions. For example, where cattle insurance is run on the principles of mutaulity, a start may be made with a premium which contains an adequate loading. As a result of such loading surplus reserves will accumulate. These can be returned to the insurer in a suitable form as bonus and the premium rates can be gradually adjusted. It may, e.g., be provided in the rules that when the reserve fund reaches a certain level the excess should be distributed among the policy holders who might have contributed to build it up, in the form of a cash bonus or a reduction of premiums to policy holders of a certain minimum duration. It may turn out, however, that in the Indian conditions premium rates with adequate loadings will prove to be beyond the means of the cattle-owner and may prevent adequate response to the scheme. on the other hand, if a start is made with moderate premiums, in case these prove to be inadequate the claims may tend to exceed the funds. In such circumstances, provision will have to be made for reducing the benefits during such periods, or for paying in additional sums by way of supplementary levies during such periods; provision may also be made for raising the premium rates, in such cases on the basis of the experience of the society. Another way in which the short fall of the income from the outgo can be met is of course through subsidies payable to the society by an outside agency such as the Government. Since it is clear that in Indian conditions, premiums with substantial loadings for contingencies and profits may prove beyond the means of the cattle owner and on the other hand, the possibility of benefits being reduced or a supplementary levy will prevent insurance from being popular, it would be desirable to start with as good an idea of the mortality rates as may be possible and to couple this with a government guarantee of the benefits payable by the society.

(c) Use of a new form of contract

13. The consideration that an insured cattle-owner, in cases where the animals survive the period of insurability, gets no tangible return for his premiums, constitutes a genuine drawback of any type of term insurance contract. The only remedy would be to permit a form of contract similar to an endowment assurance where a benefit is payable on death as well as on survival of the animal to the end of the period of insurance. There are, however, inherent difficulties in this form of contract as applied to cattle insurance, resulting from the consideration of moral hazard. Moreover, the premiums necessary for this form of contract will have to be substantially larger if the mortality cover is to be at all adequate, so that perhaps only the well-to-do class of cattle-owners could afford to insure their animals under such schemes. An endowment assurance contract will not be a one year or a half year contract and the sum assured will therefore have to be so chosen that it cannot in any case exceed the actual value of the animal at any stage during the period of insurance. This will be somewhat difficult to achieve. A contract with features of this type has been current in Coorg and has been discussed in Chapter III of this note. Under this, it has been suggested that benefits may be payable on death as well as on occurrence of permanent disability as was the case in Coorg, and that the benefits may be further limited. Further, provision for periodic revaluation of animals may be enforced even in case of animals insured under such policies so that it will be possible to keep an eye on animals who have depreciated substantially as compared with the sum insured. Only a four or five years' contract has however been recommended. Nevertheless, this may be found to meet the needs of the situation to a considerable extent.

### (d) Renewal Discount and Survival Bonus.

14. Another method suggested for avoiding disappointment from this source is to allow a substantial renewal discount or a bonus at the end of a period of continued insurance. The nature of the suggested bonus may be seen from the following bye-law framed for Cattle Insurance Societies in Bombay:

"If a member insures an animal for 8 years continuously and no indemnity has been paid to him on account of the said animal, he shall be entitled to receive a bonus equal to 40% of the minimum value of the animal."

A bonus of this form will no doubt improve a term insurance contract without involving moral hazard. It would appear however that such an additional benefit must necessarily imply a substantial addition to the premium rate unless the original premium rate can be assumed to contain an adequate margin. In the Bombay bye-laws no addition to the premium rate as originally contemplated appears to have been made at the time of insertion of the above bye-law.

The position may be appreciated easily if interest is ignored. Suppose in the usual form of contract, the sum assured is equal to two-thirds of the value of the animal at the beginning of each year of insurance and that a premium equal to 5% of the value of the animal ( i.e., 7½% of the insured amount) is charged. Assume that this is intended to cover an average mortality of about 6% during the period of insurability, so that the balance of the premium is available for expenses and other contingencies. Consider a group of 100 animals all insured at age four which continues to be insured for 8 years' losing, roughly speaking, five animals every year. 40 animals out of the group would then die at the end of a period of 8 years. The claims on account of death would be equal to the average value of 26$\frac{2}{3}$ animals. Assume now that the minimum value of an animal during the period is 75% of the average value. A sum equal to 30% of the average value is then paid under the new provisions in respect of each of the 60 animals that survive. The value of the additional benefit is therefore equal to the average value of 18 animals, i.e., the additional benefit costs nearly two-thirds of the value of the original benefit. The consideration of interest will of course reduce the premium to some extent. However, it would appear that a premium of about 7% of the value of the animal would be required. A provision of this nature, if feasible, will clearly improve the form of contract considerably. Consideration of the adequacy of the extra premium for the purpose may however require at least a broad idea of the variation of price with age in different classes of insured animals.

15. Another concession of a similar nature which has been suggested is a substantial renewal discount in the rates of premiums of an amount such as 20%. It is clear that unless the premium rates are known to contain a substantial margin, a renewal discount could not be of an amount larger than the saving in expenses resulting from renewal. A substantial renewal discount might otherwise mean that the resulting premiums would be inadequate. It may be suggested, however, that arrangements might be made for paying commissions at a suitable rate, such as 6¼% of the premiums, to agents who might sell insurance. It may be suggested that cooperative societies of various types operating in the selected areas may act as agents on a commission basis in respect of their members. The payment of commission in respect of each renewal to the cooperative societies would be an indirect way of paying a renewal discount to the insured who are members of the Society. In addition, individual agents may also be appointed. Payment of a discount equal to the commission to only those policy-holders who insure directly, may not be considered desirable from the point of view of fairness to the agency staff.

## REINSURANCE OF LIVESTOCK RISKS

### (a) Need for Reinsurance

16. The last point mentioned above, viz., the possibility of the funds not being adequate for meeting the claims during a particular period is an essential feature of the working of Cattle Insurance through small local societies. In such societies the insured are themselves the insurers; every member therefore is interested in taking all possible sanitary measures, and seeing that no negligence or malfeasance occurs; also, the fear that in case of heavy losses each member may have to lose by having to pay additional levies or by a reduction of benefits must act in the same direction. It must be remembered that in case of such societies any resources other than the premium income, such as a reserve fund built out of foundation grants by the state, share capital or entrance fees must be necessarily limited; while, on the other hand, in view of the small size of the society considerable fluctuations in experience may be expected from year to year. It is possible, therefore, that in certain years the premium income may not suffice to meet the claims. This may be due to reasons different in nature. First, the premium rates may be adequate, in the sense that over a period of year the premiums will suffice to meet claims

and expenses of administration but nevertheless in certain years the claims may exceed the premium income and in others the premium income exceed the claims. In course of time, a sufficient reserve fund out of net surpluses of good years will be built up to provide for such excess claims during bad years. But during the early stages of the scheme, difficulties might arise if a spell of bad years occurs before sufficient reserves have accumulated. It is clear that this must be considered as a probable contingency in view of the prevalence of cattle epidemics which may take a large toll of animal lives in certain years in a particular locality. Second, the premium rates may be based on an estimate of mortality that is inadequate, and therefore there would be a case for reduction of benefits or for an addition to the premiums. Even if premium rates are based on the results of a mortality investigation, it is possible that the results of the investigation apply to an area much larger than the area of operation of a small society and on that account the experience of the society might be different from that of the whole area. Also, to some extent, mortality rates experienced by a society will depend on its standard of administration and this too will give rise to variations in experience from society to society. It is clear that, in cases of this type, the premium rates will have to be modified on the basis of experience of the society over a period of years.

The size of the fluctuations of mortality from year to year will depend on the total number of animals insured and the area of operation of the scheme. Proportionately larger fluctuations will occur in case of smaller societies. One way of minimising the difficulties arising from this source is, therefore, to extend the area of operation of the scheme and to ensure the maximum possible extent of participation in the scheme. It may be suggested that no society may be started with less than 100 insured animals and it will be desirable to make the area of operation wide enough to make possible an immediate participation of at least 500 animals in each insured society.

Another accepted method by which the impact of fluctuations in experience on small local societies can be minimised is through facilities of reinsurance. It will be useful to discuss with reference to conditions in India the extent to which reinsurance would resolve the difficulties outlined above.

### (b) Forms of Reinsurance Contracts

17. Under the usual type of reinsurance contract current in connection with

cattle insurance, the reinsuring body agrees to pay a part of the risk undertaken by the primary society, provided a corresponding part of the premium is paid to it. Reinsurance may also take the form of guaranteeing a part of whole of the risk arising from specific causes such as specified contagious diseases; or of guaranteeing that if the claims in a particular year exceed a particular level, then the excess ( or a balance of such excess left after any working capital and reserve funds are applied in a prescribed manner) will be paid by the reinsuring company.

It is clear that where a part of the risk such as one half is guaranteed by an insurer, whose solvency may be considered as being beyond doubt, the result is that the insured in the primary society can rest assured that a minimum indemnity will be forthcoming in all cases, whatever the experience of the particular society. However, reduction of benefits or an additional levy will still be needed in respect of the part of the risk retained by the primary society. Any share capital or initial reserves of the society will however now be available for meeting the fluctuations in respect of only the portion of the risk retained by the society and may therefore prove more adequate. On the other hand, since half the premiums are paid to the reinsuring body, the reserves will accumulate more slowly. In fact, in the case of a contract of this type, the primary societies will incur a major proportion of the expenses of administration, while, since half the premiums are paid to the reinsurance body, it will receive only one half of any loadings for expenses provided in the premiums. The adequacy of the premiums in respect of the risk retained by the Society will therefore have to be reconsidered. For example, consider the case where half the risk is reinsured and half the premium received is paid to the reinsuring body. Suppose that a premium of Rs.10 includes a provision of Rs.2 for expenses and Rs.8 for meeting the claims. The primary society may now have to incur practically the same expenses, so that out of its share of Rs.5 of the premium only Rs.3 will be available for meeting the claims, while Rs.4 may be needed for the purpose. Of course, arrangements could be made for the primary society to receive back by way of bonus, the excess payments made by it to the reinsuring body.

18. The other types of reinsurance contract may not be feasible unless a basis for calculating the reinsurance premiums is made available. If losses due to contagious diseases could be wholly covered by insurance, a major source of extraordinary fluctuations which may endanger the solvency of a society would have been removed; and normal fluctuations could then be covered by a suitable

establishment grant or a share capital to serve as a nucleus for a reserve fund. As pointed out in an earlier section, however, the data relating to mortality due to contagious diseases is perhaps for too unreliable to serve as a basis for calculating the reinsurance premiums. However, it may be pointed that, if the scheme is worked through Cattle Insurance Societies, it would be worth while considering if Government could give such societies reinsurance facilities in respect of deaths due to contagious diseases. As has been pointed out elsewhere, free insurance against losses due to contagious diseases is provided by state in certain foreign countries; and even in India control of such diseases is admittedly a responbility of the state. In these conditions, even if free insurance may not be immediately feasible, perhaps it may be possible to extend reinsurance facilities in respect of such deaths to Cattle Insurance Societies at moderate premiums, on the basis of such data as it may be possible to obtain. This will give the staff of the Veterinary Departments an additional incentive to take prompt measures to prevent and eliminate such disease, and will on the other hand, make the working of a cattle insurance society much smoother.

It is, however, necessary to bear in mind the dangers involved in a form of reinsurance under which the entire risk in respect of certain classes of claims is borne by the reinsurer. The machinery required for control and supervision of claims will be largely in the hands of the primary insurer and in such cases there will be no incentive for such machinery to function effectively. This will be particularly important in case of deaths due to contagious diseases, where prompt reporting of the outbreaks and immediate measures of control are essential. Unless the society has a direct financial interest in controlling the incidence of disease, the sense of urgency in securing the services of the veterinary staff and strict insistence on segregation and other sanitary measures may not be forthcoming.

19. The lines on which a scheme of reinsurance under which the entire risk in excess of a certain level is undertaken by the reinsurer could be organised may be illustrated by an example. A three storied organisation may be visualised for the purpose, such as an organisation consisting of the primary society, a district reinsurance union as the primary reinsurer and a provincial or national reinsurance fund as a secondary reinsurer. For convenience, we may assume a rate of mortality of 6% and a primary society with a membership of about 400 animals. The scheme may then be described as follows:

PROPORTION OF RISK UNDERTAKEN BY

| DEATHS | SOCIETY | PRIMARY REINSURER | SECONDARY REINSURER | RATE OF MORTALITY EXPERIENCED |
|---|---|---|---|---|
| First 14 | Whole | Nil | Nil | Less than 3.5% |
| 15th to 19th | One half | One half | Nil | 3.5% to 4.75% |
| 20th to 29th | One fourth | One half | One fourth | 4.75% to 7.25% |
| 30th to 34th | Nil | One half | One half | 7.25% to 8.50% |
| 35th and others. | Nil | Nil | Whole | Above 8.5% |

It will be seen that, under this scheme, the primary society does not have to bear a risk larger than the average insured amount in respect of 19 animals in any case, i.e. a sum equal to 4.75% of the total insured amount. The primary reinsurer does not have to bear a risk larger than the average insured amount in respect of 10 animals, i.e., 2.5% of the total insured amount. The balance of the risk is borne by the secondary reinsurer.

The premiums paid by the insured will have to be shared by the three participants on an agreed basis. In the absence of any suitable data, a beginning will have to be made by estimating frequencies with which the mortality experience will fall in different ranges, on a rought basis. This will in itself depend on the number of animals insured. As an illustration, we may assume that a total premium of 7.5% of the insured amount is shared as follows: Society 5.5% of the insured amount; Primary reinsurer 1.5%; secondary reinsurer 0.5%. We may assume also that out of the Society's share of the premium a sum equal 4.5 % of the insured amount will be available for meeting claims. This would mean that the Society could pay claims equal to the insured amount in respect of 18 deaths out of the current premium income. It will make a profit if the mortality rate is less than 6.25%, and when it is higher, assuming that the amount reinsured is always available, the total reduction in benefit that may be necessary in the absence of any reserves will be equal to the value of 1 animal. The proportionate reduction will, therefore, be smaller the larger the number of claims; e.g., it will be 1/30 when the number of claims is 30 and 1/40 when the number of claims is 40.

It will be seen therefore, that the scheme has certain definite advantages. The society has a definite incentive for keeping down claims until a certain level of mortality is reached. Practically, the whole of the risk is in fact guaranteed by the reinsurer; and the maximum extent of reduction in benefits is known before-hand. But the main danger in this form of reinsurance is that after a certain level of mortality is reached, the society may cease to have any interest in controlling the claim experience; in fact, from its point of view a larger mortality may be desirable as the proportionate reduction in the amount of claims will be less when the number of claims is higher. As was pointed out above, unless the reinsurer establishes a full-scale administrative machinery for the purpose the cooperation of the primary insurer will always be essential for keeping down the rate of claims; and such cooperation could be depended on only when the primary insurer may suffer a financial loss in case he withholds cooperation. It is true that any extraordinary claim experience will generally be due to an outbreak of contagious disease; and that, in any case, the agencies of the veterinary department will have to accept the main responsibility of enforcing measures of control. If therefore, the government acts as the secondary reinsurer it could be said that an agency for supervising claims on its behalf will already be present. Nevertheless, it must be remembered that the initiative will be largely in the hands of the primary society, and the active cooperation of the society will be desirable in view of the limited staff of the veterinary departments. Moreover, the reinsurer undertakes the risk in respect of all deaths occurring after a certain level of mortality is reached whatever its cause. These must be considered as a serious disadvantage inherent in this form of reinsurance. As compared with a form of reinsurance under which a part of every claim is reinsured, the present plan may have the advantage of enabling prompt settlement of claims. The claims will be borne entirely by the society until a certain level of mortality is reached and any delays caused through reinsurance arrangements will be avoided in case of such claims. However, it may be possible for the primary society, provided funds are obtainable, to pay the whole claim in anticipation of payment of the reinsured amount by the reinsurer.

During the pilot scheme stage, it may not be considered necessary to have reinsurance arrangements at two levels. The number of Cattle Insurance Societies in each province will be limited and the need for a reinsurance union may not be there. It may be desirable, therefore, to arrange for the society to undertake the risk, shown as being undertaken by the primary reinsurer in the above scheme . This will ensure that in normal years the risk is borne mainly by the primary society while in very abnormal years it is borne entirely by the reinsurer, who may be the government. Pherhaps, the larger independence during normal years may appeal to the organisers of primary societies and any delays caused by the dilatory government procedures will be minimised during normal years.

## (C) Types of Reinsurance Organisations

20. Reinsuring bodies may be of varying types. They may be private joint stock insurance companies, or unions formed with primary societies as members, or public institutions started for promoting Cattle Insurance by providing reinsurance facilities to primary cattle Insurance Societies. A re-insurance body may itself reinsure a part of the risks undertaken by it with a secondary reinsurance body.

21. The three storied organisation of Cattle Insurance in France may be described as a typical example. In France, first, there is direct insurance through local funds with very limited areas of operation, secondly, primary reinsurance through Departmental or District funds whose sphere of activity is generally a department; and finally, secondary Reinsurance through a National Fund. The primary societies gurantee not more than 80% of the value of the animals lost. The Departmental or District funds undertake to pay a fraction such as ¼, 1/3, ½,2/3 or ¾ of the losses insured by the primary societies, provided a corresponding fraction of the premium is paid to them. The Ministry of Agriculture allows Establishment Grants when societies are formed to enable them to meet initial expenditure and also makes grants to offset particularly disastrous years. Only local funds covered by primary reinsurance and primary reinsurance funds covered by secondary reinsurance are entitled to such subsidies. The fraction of risk carried by local societies is generally small. The Reinsurance funds may, after transferring an adequate amount to their reserve fund, pay a part of their yearly profits to the affiliated funds. The departmental and district funds may find themselves in deficit in exceptionally bad years, e.g., when serious epidemics break out over wide areas. Secondary reinsurance is intended to provide against such contingencies. A class of reinsurance handled by secondary reinsurance institutions is special reinsurance of losses due to specific contagious diseases and epidemics likely to spread over the whole of one or several provinces. The losses resulting from such epidemics may obviously prove too heavy for the resources of even a well managed departmental fund. District funds can also reinsure all their risks with the National Funds, the national institution sharing a part of the cost of the loss corresponding to the fraction of the premium income which it receives. Reinsurance bodies take steps to require the payment of premiums based on the experience of a past period such as ten years. In practice a loading

is added for expenses.

22. An example of public livestock reinsurance bodies may be found in Germany. In 1935, there were in Germany four public institutions operating livestock insurance in Germany. An account of the working of the Bavarian Public Livestock Insurance Institute may illustrate how they function. It is a public institution of mut al type, the administration of which is vested in the Bavarian Chamber of Insuranc The Institute is constituted by local insurance societies joining it of their own accord, on condition of accepting the model rules established by the administratio of the Institute. The local societies are founded on the principle of voluntary a mutual participation. The Institute undertakes the covering of a fraction of the losses for which compensation must be paid by the local societies. The Institute thus acts as a reinsuring body for the local societies. The Institute is assigned not only an annual state subsidy intended as a contribution to the payment of compensation claims, but also a non-recurring grant earmarked for the reserve fund of the Institute.

Until 1912, " the half of the compensation paid was at the charge of the local society while the other half was paid by the Institute. The consequence of this strict method was that the local societies which gave less attention to management of insurance became a burden on the Institute and on the other hand other better managed societies for that very reason were led to quit the Institute. In consequence, beginning from 1912, the Institute undertook the total amount of losses, apart from dividing out at the end of the financial year, the total of the compensation payments, the administration and other expenses, between local societies on the basis of risks insured by each society and in conformity with the principles of division approved by the Committee representing the insured persons. As a rule, the basis of this division is the average over five years of the losses chargeable to each local society. In this way, the contributions of the local societies are in general determined by the relation between the average of the compensation payments made during the last five years and the average of the sums insured over the same period." As a result of this "Local Societies supervising the stock breeding carried out by their members and endeavouring so far as possible to avoid losses and to obtain good net returns may count on their contributions being reckoned at a low rate; the reverse is done for societies which follow a different course of action."

23. Reinsurance Societies were established in Burma and the Punjab for reinsuring a part of the risks undertaken by Cattle Insurance Societies. A

brief account of the working of these societies may be given here:

"The upper Burma Central Cooperative Cattle Reinsurance Society, Limited, was registered in August, 1915. The membership consists of 15 honorary members - persons interested in cooperative and agricultural improvement- and of affiliated village cattle insurance societies. It receives half the premia paid to societies by members and insures half the risk undertaken by such societies. Indemnities due are paid by the manager on the receipt of a cattle death report giving full details. It is managed by a general meeting, Committee and manager. To safeguard the interests of the government a government representative is a member of the general meeting and has five votes. It has a general fund consisting of the net proceeds of past years. The latter fund is banked with the National Bank of India and the general fund is kept in the Upper Burma Central Cooperative Bank. Societies submit to the manager of the Central Society half-yearly statements showing the names of members and numbers, descriptions and values of cattle insured."

In the Punjab, a Reinsurance Union was established in 1920 at Beri in the Rohtak District. The Union undertook half the risk on each policy of the member societies provided a corresponding part of the premium was paid to it. The Punjab Government undertook to advance loans to the Union in case of emergency to an amount equal to Rs.10 per head of the Cattle insured in the affiliated societies on the preceding 31st of December. The recovery of the loan was to begin two years after the grant of the loan, and was to be spread over five annual instalments. Thirteen societies were affiliated to the Union which insured 735 cattle.

### (d) REINSURANCE FACILITIES IN CONNECTION WITH THE PROPOSED PILOT SCHEME.

24. In the light of the foregoing discussion we may now consider the possibilities of reinsurance in connection with the proposed pilot scheme of Cattle Insurance.

First, it will be remembered that the need for reinsurance arises mainly when cattle insurance is managed through small local societies operating in limited areas and without sufficient outside resources. In case of a completely state managed scheme the question of reinsurance will, therefore, be of little importance.

Second, if it is desired to operate the scheme through small cooperative societies, reinsurance facilities may be provided in various ways. Private companies may be prepared to undertake reinsurance even when they might not be willing to undertake primary insurance of lives of animals, since, in case of reinsurance the need of a large administrative and veterinary staff in the actual areas of operation of the scheme will not be there. However, it may be expected that they may be more willing to do so and offer better terms after the experience of a pilot scheme, worked on sound lines and on an adequate scale, is available. Secondly , Reinsurance Societies may be started on the lines of the Societies which once operated in Burma and in the Punjab. Thirdly, government might itself offer reinsurance facilities.

In case of the proposed pilot scheme, the operation of the scheme in one province may be limited to a few societies. It may not therefore, be necessary to have a reinsurance body for each province. It is desirable that the reinsurance body should be in a position to watch the working of Cattle Insurance by the affiliated Societies, and to enforce adequate standards of administration. This may be difficult to achieve in case of a Reinsurance Society with its scope of operations extending over the whole country. It may be suggested therefore that government might itself undertake the work of reinsurance. This will enable it to guide the working of the pilot scheme effectively. It may be remembered that, in any case, government agencies will be intimately connected with the working of the scheme.

Third, the normal form of a reinsurance contract, which undertakes a part of the risk on payment of a corresponding part of the premium may not completely meet the needs of the situation. Under such a form of a contract, a part of the benefit which is not covered by insurance may still be liable to reduction during bad years. The need for providing against this contingency will be particularly great during the early years of the operation of the scheme before adequate reserves have accumulated. In Indian conditions, it would help the popularity of the scheme if the possibility of full benefits promised under the contract not being available could be completely eschewed. For this purpose, in addition to a scheme of reinsurance it may also be necessary to guarantee the entire benefits, by a promise of loans in years of high claims. The position then would be that government will undertake a proportion of the risk under the normal reinsurance contracts and, in addition, promise loans to cover the remainder of the benefit during a certain period. Arrangements might be made for recovery of such loans from the net profits of good years. In course of time, when the societies have accumulated sufficient reserves, the need for the loans may be felt to a lesser degree. It may also be possible, on the basis of the experience of the early years, for government to undertake reinsurance of the entire losses due to contagious disease on payment of an additional premium. If such losses are covered by reinsurance, it may be expected that the need for loans would almost completely disappear. Since the reinsuring body would be operating on an all-India basis, it would be in a favourable position to undertake reinsurance of this type. As pointed out above, in some countries insurance against epizootics is considered to be a responsibility of the state and is given free.

25. It is suggested, however, that it may be possible during the pilot scheme stage to do without the full reinsurance machinery. It may be possible to place Establishment Grants at the disposal of each society, which together with a small share capital which such societies might raise may suffice to meet normal fluctuations in experience. This will form a nucleus of a reserve fund which may be increased by addition of the net profits of successive years. It may also be provided that a major portion of the expenses of management during the pilot scheme stage, at any rate, may be paid by government; so that the expense loadings in the premiums will also go to swell the reserves. Further, in addition to the establishment grants, government may also guarantee interest free loans to the societies during the early years of the scheme, provision being made for their recovery from the net profit of subsequent years. It may be provided also, that the area of operation of the societies may be made sufficiently large so as to enable participation of at least 500 animals. This will in itself reduce the extent of proportionate fluctuations from year to year.

## CASE FOR A STATE-MANAGED SCHEME

26. In the foregoing discussion attention has been drawn to the different forms in which government will have to extend help to Cattle Insurance Societies. The help necessary is so great and varied that it may be questioned if it would not be simpler and more appropriate during the pilot scheme stage to work the scheme without the help of cooperative societies. This has been the view expressed by the Cooperative Planning Committee. They remarked that the experience gained in Burma where the entire scheme failed, inspite of the

existence of a reinsurance society, showed that the existing conditions are not suitable for entrusting the business to cooperative societies. They therefore recommended that provincial governments might undertake cattle insurance as an experiment in selected areas and after sufficient experience is gained the question of giving the insurance business cooperative form might be considered. They also recommended that after cattle insurance is organised on cooperative lines arrangements for reinsurance might be made either with the government or with reinsurance societies organised for the purpose. It will be clear from the preceding discussion that a state-managed scheme will have considerable advantages from the point of view of simplicity and workability.

As pointed out above, in the case of a state-managed scheme the insured will have an assurance that the full benefits promised under the contract will be available when needed. This feeling of confidence in its working will itself help the working of the scheme. Second, the need of reinsurance facilities and allied problems would not arise. In fact, it may be pointed out that since a government guarantee extending to the entire benefit is in any case visualised, one of the main arguments for administering cattle insurance through small cooperative societies is considerably weakened. Excessive claims will now entail no immediate financial loss to the members and to that extent the incentive for close supervision by the society would be less strong. Of course, in case profits accrue as a result of sound management the members will no doubt still benefit, and continuous bad experience may necessitate an increase in premium rates in subsequent years. However, even in the case of a state managed scheme these considerations may still be retained to a certain extent. Separate premium rates may be charged to different regional units on the basis of their own experience over a period of, say, five years, and the experience may also be taken into account in distributing any profits that might accrue. With these provisions it may be possible to appoint popular Advisory Committees in the different centres in which the scheme is operated and these may replace to some extent the managing committees of the present Cattle Insurance Societies. This may be considered as only a temporary arrangement to continue during the experimental stage of the scheme and as pointed out by the Cooperative Planning Committ an attempt might be made at the end of this period of experimentation to give the movement a cooperative form. It may be desirable, however, even in the final stages of the scheme for government to provide reinsurance facilities and to guide and control the development of the programme.

27. It has been pointed out earlier in this note that there are other strong arguments for government having a direct financial interest in the working of a scheme of Cattle Insurance. The need for government help to any scheme through provision of free veterinary facilities has been emphasised. Societies have in any case to depend on such help and it could be given more effectively if the government agencies were directly integrated with the working of the scheme of Cattle Insurance, instead of being instructed to help the societies when called upon by the managing bodies of such societies to do so. The work of Cattle Insurance will no doubt promote greatly the objectives which the veterinary departments have in view.

In fact, Dr. Narayan Swamy Naidu suggested, in his report on Rural Indebtedness in Madras, that a scheme of Cattle Insurance may be worked by the veterinary departments, in the following words: "What I would suggest for the successful operation of the scheme is that its working must be entrusted to the Veterinary Department. It should be a government and not a private insurance scheme. The advantage of making the veterinary department responsible for it is that it will help the department to get into closer touch with the peasants to effectively prevent the outbreak or spread of an epidemic."

It has been pointed out that for success of the scheme considerable publicity and propaganda for popularising the scheme will be necessary. For organising this a full time officer, such as a Joint Registrar of Cooperative Societies in charge of Cattle Insurance, may have to be appointed in each Province, even if the scheme is administered through Cattle Insurance Societies. In case the scheme is administered by the Government, either directly or by providing reinsurance facilities, a suitable full time staff will be automatically available to undertake work of this kind.

## ROLE OF COOPERATIVE MOVEMENT IN CONNECTION WITH A STATE-MANAGED SCHEME.

28. Even in connection of a purely state-managed scheme it is clear that the cooperative societies of various types could play a role of considerable importance. The services of societies like Credit Societies, Milk Producers' Societies, Cattle Breeding Societies, etc., could be availed of for the purpose of selling insurance, collection of premiums and for publicity among their members. In return for such services they might be paid a commission on the business which comes through them. There are also other ways in which such Societies could help the work of Cattle Insurance. Credit societies as well other

societies who advance loans to members situated in the area of operation of the Cattle Insurance scheme could adopt a byelaw making it obligatory on members to insure all animals purchased out of the loans taken by them from such societies. It has been also suggested that the credit societies could and should give to members desiring to insure their animals the facility of paying their insurance premia out of the compulsory deposits. Government could also insist on insurance of the animals purchased out of the loans given by them. The cooperative Unions in the various provinces could also undertake valuable work in connection with publicity. Since it will be desirable that in the ultimate comprehensive form Cattle Insurance should be managed by cooperative societies with state help in various forms, it will clearly be worth while making every affort to associate the official and non-official workers in the cooperative movement as closely as may be possible with the working of the scheme.

# CHAPTER VI

## DATA ON CATTLE MORTALITY IN INDIA

## NEED FOR INFORMATION ON CATTLE MORTALITY

1. A scheme of Cattle Insurance obviously presupposes the existence of some information about mortality of cattle. It is true that in many countries schemes have started without a precise idea of rates of mortality and a more precise idea has been obtained in course of the working of the scheme. This type of procedure, however, implies certain consequences which may not be desirable in the present conditions in India. First, if rates of premium are based on rough estimates of mortality it may be necessary to load them substantially for contingencies; the surplus loadings will emerge as profits which could then be distributed. This would, however, mean heavy premium rates which may result in making insurance unworkable in India. As a second alternative, premium rates may be charged without any loadings for safety, but the contingency of the premiums proving inadequate may be met by reducing benefits or by making supplementary levies on all members of the society. Any doubt about the assured benefits failing to materialise would make insurance unpopular in India while supplementary levies may not also be feasible. The last alternative would be that some outside body, such as government or a large insurance company should guarantee to make good any inadequacy in the premium income. A state guarantee would appear to be the only practicable course in India, but even then it may be considered desirable to limit the extent of government help by trying to obtain as good an idea of mortality among different classes of animals as may be possible under the circumstances.

2. As has been pointed out elsewhere, schemes of Cattle Insurance were put into operation in Burma and in different provinces in India. These were started without any systematic preliminary investigations into the mortality of cattle and rates charged for different animals in different provinces varied considerably. In the absence of any data, it is difficult to see if these differential rates were intended to reflect any real difference in mortality experience in the different provinces. For example, for insuring plough bullocks the rate charged for a sum assured equal to two-thirds of the value of the insured animal, was 5% of such value in the Punjab and Bombay, 4 1/6% in U.P. and 3½% in Madras. Further, separate rates for male and female animals were not charged except in Madras.

Since it is clear that in India the rates charged should be as low as may be consistent with considerations of safety, the appropriate level of premiums could only be decided on the basis of an actual investigation in mortality. Unfortunately, the scale on which Cattle Insurance was operated in the various provinces in India was far too inadequate to make the experience of the actual working of the societies itself of much value from this point of view.

3. At present, no published data relating to mortality of cattle is available apart from statistics of reported deaths due to contagious diseases published by the various provinces. Not only do such deaths represent only a fraction of the total deaths, but even as statistics of mortality due to a specific group of causes their utility is very limited in view of the considerable doubt about their reliability. The reporting is known to be substantially incomplete and the classification of deaths according to the cause faulty. Some information about such data is given in Chapter IV and appendix A.

4. It is clear, therefore, that investigations into such data on cattle mortality as may be available will have to form an essential preliminary step before a scheme of Cattle Insurance is inaugurated. The data so obtained will be supplemented by the information collected in course of the actual working of the scheme so that at the end of the five-year period of the operation of the scheme a well-defined basis for Cattle Insurance may be available.

## NATURE OF THE REQUIRED DATA

5. It may be worth while mentioning here certain elements of simplicity in the problem as visualised above. First, Cattle Insurance is a one year or half year contract and it will be possible to vary the rates of premium charged from year to year. It may, therefore, be feasible to make a beginning with a broad estimate of the mortality rates. Secondly, it is usual to confine insurance to the period of utility of the animals, so that very young ages and older ages are excluded. It is also usual not to charge differential premiums according to age. It will therefore suffice if an overall rate applicable to the period of insurability is available. It is to be expected that over the limited period of insurability of the animals the variation in mortality may not be substantial. However, it would be desirable, if possible, to obtain an idea of such variation so that allowance could be made for the variations in the number of animals insured at different ages.

6. The following remarks may help to give an idea of the nature of the information required.

(1) The proposed scheme is intended to operate in both rural and urban areas. The data collected will therefore have to reflect mortality in average conditions prevailing among the small scale cattle owners in such centres.

(2) Considerable variations are known to occur between animals in different regions. It was pointed out, e.g., that while a premium of 15% may not be adequate in view of the heavy mortality in the southern wet zone in Burma, in the central dry zone insurance cover was provided at a premium of 5%. It will, therefore, be desirable to have separate rates of mortality applicable to different regions, if possible. This may be desirable, even if the scheme is operated on an all-India basis, since allowance will have to be made for varying proportions of animals from different regions which may enter the scheme. It is suggested, however, that regions which are not congenial to the health and efficiency of animals may be excluded from the area of operation of the scheme during the pilot scheme stage.

(3) Further, subclassification of the animals according to species (oxen or buffaloes), sex and age will also be desirable for purposes of investigating mortality.

In India, it has been usual to exclude female oxen from insurance while female buffaloes were generally included at the same rates as male animals. Private companies charge substantially heavier rates for female animals and also cover calving risk separately. As, in the case of urban centres, milch animals will form a large proportion of insured animals it will be desirable to study the variation in mortality in two sexes and to charge separate rates, if necessary.

A distinction between oxen and buffaloes may also be made since certain diseases are known to have a differential incidence among them and the periods of utility, etc., may differ between the two species.

As pointed out above, it will suffice for purposes of Cattle Insurance if a single mortality rate were obtained for the insurable group of ages. It may be expected that an overall mortality rate for all ages would be comparatively heavy as the mortality among young stock, especially during the first year of age, may be heavy; young animals are known to be susceptible to certain diseases and they are likely to receive less care than the more fully productive animals. Even if it is proposed to study mortality according to broad age groups, it will be desirable to separate young stock from adult animals. It will also be desirable to separate older animals who have passed the insurable ages but this may not be feasible unless detailed records of the history of each animal could be available. In any case, it could be expected that an over-all rate obtained for all adult animals would be safe when applied to the insurable group of animals only.

(4) Lastly, it will be desirable to study mortality due to contagious disease separately from that due to normal causes. As pointed out elsewhere, the mortality due to contagious disease may introduce wide fluctuations in experience and will make reinsurance essential and it will be desirable to understand the extent of such fluctuations. Also, for securing an idea of the average rate due to epidemic mortality data relating to a comparatively long period of years may have to be studied, since, in case data for a short period is studied, the rates may tend to be too heavy in case an epidemic of substantial dimensions has occurred during the period, or too light if no epidemic has occurred.

## POSSIBLE SOURCES OF DATA ON CATTLE MORTALITY
## (A) GOVERNMENT FARMS

7. We may next consider the various sources from which it may be possible to obtain data of this nature. It will be remembered that information will be required about the number of deaths of animals over a period of years and for such information reliance will have to be placed on written records of history of animals or on the memory of the cattle-owner. Systematic records of the mortality of animals are maintained in various government cattle farms in the country. These may be classified into Military Dairy Farms in different centres and the other Government Cattle Farms in the different provinces. Information about the sizes of such farms is given in appendices II and III. In the Military Dairy farms two cards are maintained in respect of each animal, giving the complete history of the animal. From the records of such farms it will be possible to analyse data separately according to species, breed, sex and age. In addition, ancillary data of considerable value may also be obtained in relation to factors such as disability-physical, productive or reproductive-about prices of animals at different ages and levels of production, etc. It may also be

possible to obtain an idea of the period of productivity of the animals. For this purpose, it is suggested that prices of animals purchased and sold during the period of observation may form part of the information collected.

8. An idea of the size of the data obtainable from government farms may be obtained from the appendices. The number of animals maintained on Military Dairy farms increased considerably during war years. This may be seen from the following figures giving the total number of animals of different classes on such farms:

| | 1939 | 1940 | 1941 | 1942 | 1943 | 1944 | 1945 | 1946 |
|---|---|---|---|---|---|---|---|---|
| 1. Buffaloes and Cows (Milch) | 7429 | 7820 | 10040 | 15963 | 27103 | 40423 | 51960 | 41006 |
| 2. Cows and Female Buffaloes (Young Stock). | 2654 | 3190 | 4222 | 5065 | 5065 | 5929 | 7129 | 3234 |
| 3. Bulls all classes | 452 | 442 | 646 | 947 | 604 | 1003 | 1471 | 1633 |
| 4. Bullocks, Horses, Ponies and Mules. | 1110 | 1417 | 1482 | 2000 | 2665 | 3781 | 5014 | 5159 |
| Total | 11695 | 12869 | 16390 | 23975 | 35437 | 51136 | 65637 | 56032 |

The number of Cattle was 30,909 on 30th June, 1947, while it was reduced to 14,648 on 30th June 1948. It is clear that, if data relating to the war years are investigated, it may be possible to obtain a considerably larger number of years of exposure. However, the rates so derived will relate to conditions which are not representative of the normal experience of such farms and the class of animals may not be as good as is normal, since a large number will have been purchased from outside. Further, the data in respect of a large proportion of animals will be available only for a few years and may not be as complete and accurate as during a normal period. It would appear desirable, therefore, to invetigate data relating to a period prior to 1940. Since it is desired to classify the animals according to geographical regions and other categories, it will be necessary to investigate data over a period of at least 10 years. During such a period an average strength of 12,000 animals may be assumed. It will be noted that the necessary data will have to be collected from the records of the military farms which are spread all over the country. These farms are situated at the following places.

Southern Command: Ahmednagar, Bangalore, Belgaum, Deolali, Jubbulpore, Kalyan, Kirki, Pimpri, Secunderabad, Wellington.

Eastern Command: Agra, Allahabad, Bareilly, Dehra Dun, Jhansi, Kanpur, Lucknow, Meerut, Namkum, Panagarh.

Western Command: Ambala, Delhi Cantonment, Ferozepore, Jullundhur, Mhow, Pathankote.

9. We may next consider the number of animals on the other Government cattle farms maintained in various provinces. There were nearly 16000 cattle on such farms in 1947-48. Of these 9000 were on the Hissar farm in East Punjab; so that the Government Farms in other provinces would have a total strength of only 7000 animals. Data relating to a period of 10 years may be investigated from such farms also. The provincial distribution of the number of animals on the Cattle Breeding farms is given in appendix II.

10. The data obtained from Government Farms will be of great value in view of its completeness and reliability; and will enable rates of mortality to be calculated for each age for each class of animal. It must be remembered, however, that it will refer to conditions which may not be entirely representative of those obtaining among the class of animals which it is proposed to insure. It is clear that mortality among animals will to a large extent be a function of factors like housing, tending, feeding, standards of sanitation, veterinary facilities, etc., and, in respect of these factors, the conditions on the government farms could be described as optimum rather than average. Another important consideration from this point of view is the large number of castings of incapacitated animals which are known to take place on government farms; animals are disposed of for a variety of reasons such as low yield, contagious abortion under trouble, sterility, physical defects, etc. It may be expected that owing to such selective exits, the animals remaining on the farm will experience lighter mortality. This factor must also be taken into account in utilising government farm data as basis for premium rates for Cattle Insurance. However, it may be remembered that a similar weeding out of the poorer type of animals will occur among the insured classes of animals as a result of non-renewal of policies on the lives of animals on grounds of health, or on account of their having depreciated in value. The experience of the government farms will afford a preliminary basis for premium rates for different classes of animals, provided due allowance is made for the foregoing considerations.

## (B) SAMPLE ENQUIRIES IN THE VARIOUS CENTRES

11. It is suggested, however, that it will be advisable to supplement the data from government farms with data obtained through actual sample enquiries in the area of operation of the scheme. The data so obtained will not of course compare

with that obtained from government farms from the point of view of completeness or reliability; but it will relate to conditions prevalent among the actual class of insured animals and will therefore prove of great value as a basis for modifying premium rates derived from the government farm data. Since no records of any kind are likely to be available, reliance will have to be placed on the memory of cattle-owner for the information asked for. The enquiry, therefore, may have to be confined to information relating to a period of only two years preceding the date of enquiry. It will be advisable to make the periods begin and close on some well-known festival day of local importance, such as Diwali or Holi. Further, an elaborate age classification will not be feasible. It may suffice to ask for information in two broad age groups,viz, young stock under 3 years of age, and adults. The information may also be classified according to species (oxen and buffaloes) and sex. The information required will be, the number of deaths in each group during each year, and the number of animals existing in each class at the beginning and end of each one-year period. It will be desirable to state separately the deaths occurring as a result of contagious disease from those from other causes. It may also be useful to obtain information about other movements in and out during each one-year period, such as births, purchases, sales etc. Data of the prices of animals purchased and sold would also be of value. In respect of each holder, an indication of his status and occupation, and of conditions of housing and sanitation in which the animals are kept may be obtained. Further, in respect of each sampled village, information as regards susceptibility to various types of contagious disease, conditions regarding drinking water for animals, grazing facilities, extent of stall-feeding, etc., may also be obtained.

## PROCEDURE AND COST OF INVESTIGATIONS

12. Next, a suitable procedure for collection of data on the lines suggested above may be described here with estimates of the costs involved: The basis on which costs have been estimated is given in appendix I.

As pointed out above, the data relating to government farms will have to be collected from the respective farms. A convenient way of obtaining the information speedily will be to place a suitable sum at the disposal of the officer in charge of each farm for payment to the staff required for extracting the relevant information from the records of such farms. It is suggested that suitable printed cards may be supplied to each such officer and payment made at the flat rate of

1 anna for filling in and checking the information on each card. The total cost of the investigation may then be summarised as follows:

| | |
|---|---|
| Cost of cards | Rs. 900/- |
| Cost of collecting the data | Rs.3,500/- |
| Cost of analysing the data | Rs.1,350/- |
| | Rs.5,750 |

A rough idea of the cost of sampling enquiries on the basis suggested above may also be given here. It may be pointed out in this connection that valuable information on the relative efficiencies of various forms of sampling technique as applied to data of this kind will be available as a result of an investigation which the Indian Council of Agricultural Research proposes to conduct in C.P. & Berar; it is understood that information on cattle mortality will be obtained in connection with this investigation. Assuming a rate of mortality of about 5% among cattle it may suffice to take a sample of nearly 4000 animals in each centre to obtain estimates of mortality of sufficient precision. It will be remembered that information in respect of each animal will be available in respect of two years

As indicated in appendix I the cost of collection of data by actual sample enquiries in each centre may be taken as Rs.500/-. In addition, provision will be necessary for analysing the data. The total costs of sample enquiries may therefore be summarised as follows:

| | |
|---|---|
| Cost of collecting data in 12 centres | Rs.6,000/- |
| Cost of analysing data | Rs.1,500/- |
| | Rs.7,500/- |

It is understood that sampling enquiries are proposed to be undertaken in connection with the 1951 Agricultural Census. It is suggested that the possibility of collecting information about cattle mortality in connection with such enquiries may be considered.

# APPENDIX I
## TO CHAPTER VI

## ESTIMATE OF COST OF CATTLE MORTALITY INVESTIGATIONS

(a) Investigation of data from Government Farms.

As has been pointed out, we may assume an average strength of 12,000 animals on the Military dairy farms. A card will have to be prepared in respect of each animal which was on the farm at the beginning of the 10 year period of observation and in respect of each subsequent entrant through birth or purchase. It may be expected that a total of 24,000 cards may have to be prepared. At the rate of payment suggested above the total payment for writing the cards, will therefore be Rs. 1,500. The cost of directly appointing special full-time staff for collecting the information will be approximately the same. Assuming that 50 cards could be prepared and checked by one person in a day, the work will require 480 working days for one man. 10 persons will therefore have to be employed for 2 months to complete the work. If each person is paid Rs.75/- per month, the total salaries paid will be Rs. 1,500/-. on similar considerations the cost of obtaining information in respect of the other government farms, which may be expected to have an average strength of 16,000 cattle, may be taken as Rs. 2,000/-. The other items of cost involved will be the price of 60,000 cards which will have to be printed and cost of the additional staff necessary to analyse the data collected. At the rate of Rs. 15/- per thousand, the cost of the cards will be Rs. 900/-. Assuming that an additional staff of three computors each working for a period of three months is engaged for the purpose, each on a salary ( including allowances) of Rs. 150/- per month, a total cost of Rs. 1,350/- will have to be incurred for analysing the data.

The total cost of the investigation will therefore be as follows:-

| | |
|---|---|
| Cost of collecting data from Military Farms. | Rs. 1,500 |
| Cost of collecting data from other government farms. | Rs. 2,000 |
| Cost of cards. | Rs. 900 |
| Cost of analysing the data. | Rs. 1,350 |
| | Rs. 5,750 |

(b) Cost of Collecting data by Sample Enquiries.

It is assumed that data in respect of 4,000 animals will be collected at each centre.

Assuming that there are nearly 200 adult animals in each village it may suffice to investigate completely a sample of nearly 20 villages in each centre. Assuming, further, that one investigator could cover five villages in a month, four such investigators may be needed in each centre each for a month. If the investigator is paid Rs.125/- p.m. including all allowances the cost of collection in each centre may be taken as Rs.500/-(in each centre.) The discussion refers to a rural centre; a similar sum may be adequate also for other centres including urban and suburban areas. It may be expected that in such areas the average number of cattle owned by a holder will be larger. If sampling enquiries are conducted in all the 12 centres, the total cost of collection of data will therefore be nearly Rs.6000/-. In addition, additional staff will also be needed to analyse the data. The cost of this may be taken as roughly Rs.1,500/-. The total cost of the enquiry may therefore be estimated roughly as Rs.7,500/-.

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## APPENDIX II TO CHAPTER VI

### CATTLE IN THE PROVINCIAL CATTLE BREEDING FARMS IN INDIA DURING 1947-48.

| PROVINCE | NO. OF CATTLE BREEDING FARMS. | NUMBER OF CATTLE KEPT | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|
| | | OXEN | | | BUFFALOES | | | |
| | | YOUNG STOCK | ADULTS | | YOUNG STOCK | ADULT | | |
| | | | MALE | FEMALE | | MALE | FEMALE | |
| Bihar | 5 | 600 | 277 | 376 | 66 | 10 | 53 | 1,382 |
| Bombay | 5 | 168 | 75 | 87 | 41 | 9 | 453 | 833 |
| Coorg | 1 | 12 | 5 | 20 | 10 | 3 | 36 | 86 |
| Delhi | 1 | 82 | 15 | 67 | - | 2 | - | 166 |
| East Punjab | 1 | 6,374 | 504 | 2,812 | - | 2 | 54 | 9,746 |
| Madras | 2 | 930 | 120 | 465 | 53 | 5 | 44 | 1,617 |
| Orissa | 3 | 191* | 48 | 53 | - | 3 | 18 | 314 |
| U.P. | 5 | 661* | 518(a | 460 | - | 109 | 243 | 1,991 |
| C.P. & BERAR (b) | 4 | 526 | 112 | 306 | 58 | 12 | 30 | 1,044 |

* Includes the buffaloes youngstock.

(a) Includes some of the buffalo bullocks.

(b) Figures relate to 1937-38.

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## APPENDIX III TO CHAPTER VI

## STRENGTH OF CATTLE ON THE MILITARY FARMS AS ON 1ST APRIL, 1949.

| FARMS | O X E N | | | BUFFALOES | | | BULLOCKS |
|---|---|---|---|---|---|---|---|
| | YOUNG STOCK | ADULTS | | YOUNG STOCK | ADULTS | | |
| | | BULLS | COWS | | BULLS | BUFFS | |
| Ahmednagar | 87 | 4 | 52 | 156 | 5 | 277 | 73 |
| Belgaum | 94 | 2 | 44 | 29 | 2 | 74 | 28 |
| Bangalore | 112 | 3 | 132 | 147 | 11 | 860 | 42 |
| Deolali | 48 | 2 | 62 | 136 | 7 | 343 | 42 |
| Jubbulpore | 193 | 4 | 198 | 150 | 8 | 413 | 120 |
| Pachmari | 7 | 1 | 31 | - | - | - | 4 |
| Kalyan | - | - | - | 168 | 9 | 409 | 31 |
| Kirkee | 154 | 9 | 291 | 240 | 12 | 536 | 123 |
| Pimpri | - | - | 1 | 196 | 12 | 793 | 85 |
| Secunderabad | - | - | - | 35 | 3 | 356 | 34 |
| Wellington | 11 | 2 | 55 | 7 | 3 | 59 | 16 |
| Agra | 105 | 2 | 65 | 60 | 3 | 157 | 48 |
| Allahabad | 40 | 4 | 54 | 57 | 2 | 112 | 50 |
| Bareilly | 6 | 1 | 28 | 100 | 3 | 208 | 50 |
| Dehradun | 131 | 3 | 149 | 50 | 6 | 406 | 42 |
| Jhansi | 64 | 2 | 44 | 90 | 3 | 164 | 44 |
| Kanpur | - | - | - | 94 | 3 | 201 | 53 |
| Lucknow | 86 | 3 | 98 | 145 | 15 | 421 | 199 |
| Meerut | 213 | 13 | 192 | 267 | 12 | 901 | 304 |
| Namkum | 15 | 1 | 37 | 78 | 6 | 360 | 42 |
| Panagarh | - | - | - | 30 | 2 | 76 | 17 |
| Ambala | 163 | 6 | 142 | 240 | 8 | 495 | 108 |
| Delhi | - | - | - | - | - | - | 4 |
| Ferozepore | - | - | - | 244 | 8 | 427 | 62 |
| Jullundur | 99 | 4 | 124 | 116 | 6 | 492 | 65 |
| Kasauli | - | 1 | 38 | - | 1 | 6 | - |
| Mhow | 73 | 2 | 65 | 42 | 2 | 48 | 38 |
| Pathankot | 13 | 1 | 31 | 3 | 1 | 97 | - |
| TOTAL | 1714 | 70 | 1933 | 2880 | 153 | 8691 | 1724 |

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## CHAPTER VII

## SUGGESTIONS FOR A PILOT SCHEME OF CATTLE INSURANCE

1. In the previous chapters various aspects of the problem of Cattle Insurance in India have been examined at some length and suggestions have been made in connection with various features of the scheme. It is proposed in this chapter to bring together in brief the various points and outline a suitable form of organisation for a pilot scheme of Cattle Insurance.

### PRELIMINARY INVESTIGATION OF MORTALITY

2. It will be desirable to allow separate premium rates for animals of different species and sexes. Also it will be desirable to vary the premium rates between different regions, if necessary, so as to allow for any variation in mortality between such regions. Since no data on cattle mortality is at present available in India, it will be necessary for this purpose to undertake separate investigations to collect and analyse data from different sources.

Two sources of such data have been suggested. First an investigation may be made into the records of Military Dairy Farms and other Government Cattle Farms. Second, sample enquiries in the various areas of operation of the scheme may be conducted for ascertaining the rates of mortality relating to the various classes of animals in the areas of operation of the scheme in the various provinces.

3. A concrete picture of the working of the scheme could not of course be given until a fairly reliable idea of cattle mortality is available. However, such data as are available as well as the practices of the Cattle Insurance Societies in India in the past would appear to indicate that a mortality rate of six percent per annum may be assumed for purpose of preliminary estimates.

### ADVANTAGES OF A PILOT SCHEME ON AN ALL-INDIA BASIS.

A pilot scheme of Cattle Insurance may be confined to a compact area in a single province or operated in regions spread over different provinces. A scheme confined to a compact area will of course have certain advantages from the point of view of more effective organisation of selling of insurance and perhaps smaller costs of administration, since a scheme could then be worked with a larger proportion of lower categories of the staff. But the experience gained in course of the operation of the pilot scheme must be judged in terms of the objectives of the scheme. Cattle Insurance may be considered as an urgent need in all the provinces in India; and from the point of view of extension of the scheme in different provinces, a pilot scheme with operations spread over different provinces will have much greater value. Provided the operations in each province are on a certain minimum scale, the experience obtained in each province will clearly form a more appropriate basis for extension of the scheme in the province. Further, in course of the working of the pilot scheme, personnel will be trained in techniques of Cattle Insurance in each province which may form the nucleus of the necessary personnel for further extensions of the scheme. One of the objectives of the pilot scheme must be to educate the people in various provinces into appreciation of the benefits of the Cattle Insurance. From this point of view, also, it would be useful to make a beginning on a small scale in each province. It is clear that a pilot scheme spread over different provinces will be much less expensive than separate uncoordinated pilot schemes one in each province.

5. There are two further considerations, which point in the same direction. First, a wider geographical base of operations may tend to ensure greater stability in the experience under the scheme. This will be appreciated when it is remembered that cattle epidemics may spread over wide areas in each district or in neighbouring districts and a wider geographical distribution will help to average out the incidence of heavy mortality in any year due to such epidemics. Secondly, as pointed out elsewhere, for successful working of a scheme of Cattle Insurance, the field agencies of the veterinary departments in the various provinces may have to be supplemented in the areas of operation of the scheme. The rate at which veterinary personnel is being trained in different provinces is very slow and the availability of the necessary staff must be considered as a limiting consideration on the scope of operations of the scheme in each province. A scheme with operations in each province confined to a compratively small area will mean a smaller strain on the resources of the veterinary departments.

As pointed out above, the operations in each province must be on a certain minimum scale in order that the experience in each province could be of value for further extensions of the scheme.

When Cattle Insurance operations in each province are on a sufficiently extensive scale, it may be possible, of course, to organise Cattle Insurance on a purely provincial basis. But for reasons mentioned above, the rate of extension of the scope of operations may be slow; and in any case, during the pilot scheme stage a scheme on an all-India basis will have definite advantages.

## SELECTION OF AREAS FOR THE OPERATION OF THE SCHEME.

6. It has been pointed out that in rural areas bullocks and she-buffaloes are better tended and fed as compared with cows and that cows may prove bad risks for insurance since they are likely to be the first to succumb during bad seasons. Also, from the point of view of the needs of the cultivator in rural areas, it may suffice to confine insurance to plough and cart bullocks and breeding bulls in rural centres. Perhaps it may be advisable to include female buffaloes also in the class of insurable animals in rural centres at appropriate rates of premium.

Consideration will also have to be given to the possibility of extending insurance to milch animals so as to encourage milk production and dairying. Production of milk is generally much too scattered in India as a whole, but is found concentrated in the villages surrounding the cities. The saleable demand for fluid milk is largely concentrated in urban areas. In such areas milch animals have a good value and are considerably better housed, tended and fed. In undivided India there were 14.6 lakhs of cows and 9.6 lakhs of she-buffaloes in urban areas. It has been estimated that about 61% of the milk requirements of urban areas are produced within the city, 26% are obtained from within five miles of the city and 13% from areas at distances 5 miles and over. The urban producers keep larger herds than their village co-professionals and maintain more regularly the strength of their milch stock. In fact, it has been pointed out that the active demand for freshly calved cattle in breeding tracts comes mainly from urban producers of milk. In the main urban areas, milk-production and sale societies organised on a cooperative basis have come into existence. As has been pointed out these could be of considerable assistance in organising Cattle Insurance. In view of this consideration, it may be suggested that insurance of milch animals may be confined to urban centres and areas within a radius of 5 miles from such centres; and to members of cooperative unions at even greater distances.

It is suggested therefore that the operation of the scheme should be confined to a few rural centres and a few urban centres. A beginning may be made by trying to popularise insurance in one rural and one urban centre in each province.

8. The rural centres may be located in a main breeding trace in each province. Pherhaps in selecting rural centres it will be desirable to exclude the wet regions which are known to be not favourable to the health and efficiency of the animals. The following tracts may be suggested for this purpose:

Kangayam tract in Madras, Kankrej tract in Bombay, the Malvi tract in C.P. and Berar, the Kosi ( Mhewati) tract in U.P., Hariana tract in East Punjab and Bachaur tract in Bihar.

The actual selection of the centre in each such tract may be done in consultation with the Provincial Governments. Areas will be selected where the scheme may have the best chance of successful working. Some of the considerations which may usefully be borne in mind in this connection are indicated below:

1. Tracts may be selected where animals are of good value. Such animals may be better treated and the owner may be more interested in insuring them.

2. It would be desirable that in the selected regions the cattle-owners should be economically well-off, and comparatively better educated and more progressive in outlook. Development of cooperative movement, animal husbandry, dairying, etc., might be suitable indications. This may ensure better participation in the scheme, satisfactory conditions as regards feeding, housing, etc., willingness to take measures against diseases and superior ability to meet the impact of adverse seasonal conditions.

3. The climatic and other environmental factors should be suitable for health and efficiency of catlle. It is known that certain districts are more susceptible to frequent and more virulent attacks of contagious disease; these

may be excluded. Tracts liable to frequent fodder shortage and water scarcity may also be excluded. Areas of heavy rainfall which are known to be not conducive to health and efficiency of cattle may also be excluded.

4. Areas in which other programmes of cattle improvement and disease control have already made headway and where the field agencies of the veterinary and animal husbandry departments are well developed may have certain advantages. Apart from official agencies, existence of non-official persons and institutions who may cooperate in the working of the scheme will be a great asset.

9. As regards the selection of urban centres the following cities may be suggested:

Madras, Bombay, Nagpur, Lucknow, Calcutta and Delhi. The total bovine population of these cities and surrounding areas is given in appendix II. The following additional information about these centres may be found useful. The data relates to 1935 and has been extracted from the report on the Marketing of Milk in India and Burma.

| City | Quality of milk produced daily in the city. (Maunds) | Quantity of milk imported daily from suburbs. (Maunds) | Daily per capita consumption of fluid milk. (ounces) |
|---|---|---|---|
| Delhi | 325 | 1200 | 4.9 |
| Lucknow | 585 | 114 | 3.4 |
| Calcutta | 1,727 | 1727 | 3.8 |
| Bombay | 2,500 | 1250 | 4.3 |
| Nagpur | 266 | 91 | 3.9 |
| Madras | 972 | 243 | 2.3 |

In these cities considerable headway in cooperation in the marketing of milk has been made. It is clear that producers cooperatives could help the work of Cattle Insurance Societies by acting as agents for the cattle insurance organisation for securing business and for carrying out publicity and propaganda. Also, new Cattle Insurance Societies could be formed to work in close association with such cooperative societies. Milk Supply Unions have been working in these cities for a considerable time and an idea of the scope of their activities may be obtained from the following information.

| Name of the Union. | Year to which data refers. | No. of primary societies. | No. of members. | Average quantity of milk handled per day. | |
|---|---|---|---|---|---|
| | | | | Maunds. | Seers. |
| Calcutta Co-operative Milk Supply Union. | 1936-37 | 123 | 8,559 | 104 | 24 |
| Lucknow Milk Supply Union. | 1939-40 | 40 | 450 | 31 | 15 |
| Madras Coop. Milk Supply Union. | 1938-39 | 14 | 800 | 88 | 13 |
| Talangkhery Coop. Dairy Society, Nagpur. | 1936-37 | 1 | 18 | 29 | 4 |

The Calcutta Union employs a veterinary inspector who inspects and treats the animals and it also distributes stud bulls for free service to member cows. The Madras Union advances loans to members of affiliated societies for pu chasing milch cattle and fodder. Under a recent scheme for increasing milk supp to the city, government has sanctioned to the union an interest free advance of Rs.4.20 lakhs for purchase of milch cattle. It would be in the interest of such societies and other societies who grant loans for the purchaso of animals to insist that the animals are protected by insurance.

The following discussion assumes that the pilot scheme for Cattle Insuranc will operate in six rural centres and six urban centres specified above.

## THE SCOPE OF OPERATIONS IN EACH CENTRE

10. It is desirable that the experience obtained in the course of the working of the scheme during the experimental stage should be of value in providing a more satisfactory basis for insurance and for extending the scope of the scheme. In view of this, it will be desirable to select centres of sufficient extent to enable the participation of 1,000 to 2,000 animals in each selected centre.

The number of oxen per sq. mile varies from one area to another. However, a rough idea of the extent of the area of operation which may be necessary may be obtained from the following figures giving the number of oxen per square mile in each province.

| Madras. | Bombay | C.P. & Berar | Bihar | U.P. | Punjab | Bengal |
|---|---|---|---|---|---|---|
| 129 | 94 | 85 | 181 | 218 | 93 | 292 |

It will be remembered that in rural areas it is proposed to confine insurance mainly to working bullocks. It may be assumed that roughly 40% of the oxen will be working animals. The second factor to be taken into account will be the possible extent of participation. It may be reasonable to assume that on an average, during the five-year period in which the pilot scheme operates, at least 10% of the working bullocks in the different rural centres may be insured. On this basis, it may be possible to have per 100 sq. miles, 400 insured animals in Bombay, C.P. & Berar, and East Punjab, 500 in Madras, 700 in Bihar and 850 in U.P.

## CHOICE OF THE TYPE OF ORGANISATION

The relative advantages of a scheme operated through Cooperative Cattle Insurance Societies, with help from government in various forms, and a scheme managed entirely by government have been discussed at some length in Chapter V. As was pointed out there, there are advantages in either type of organisation and the decision may depend on whether sufficient initiative and enthusiasm for working Cattle Insurance Societies could be made immediately available in different areas. A mixed form of organisation may also be feasible; for example, in urban areas where cooperative milk producer's unions are already in operation, it may be possible to organise Cattle Insurance Societies with their help and cooperation; while in rural areas, it may be considered desirable to operate the scheme without the help of such cooperative societies. Conditions might also differ from province to province. In these circumstances, it is suggested that a decision may be arrived at in this connection in consultation with the various provincial governments. In the following pages suitable administrative machinery has been outlined for a scheme managed through cooperative societies and also for a scheme managed entirely by the state. It may be remembered that the problem here is merely in connection with the pilot scheme stage; and could be considered separately from the opinions held about a suitable form of organisation for a comprehensive Cattle Insurance programme which may develop later.

## ORGANISATION FOR A SCHEME ADMINISTERED BY CATTLE INSURANCE SOCIETIES

### (a) Number and areas of operation of the Societies.

12. As pointed out earlier, it is desirable that the area of operation of

each Cattle Insurance Society should not be so large as to prevent effective supervision of the insured animals by the members of the Society. Also, in order to enable prompt measures being taken for treatment, etc., it is necessary that easy access to a representative of the society should be possible to each member of the society. On the other hand, it is desirable that the number of insured animals in each society and the area of operation of the scheme should be as large as possible, so that wide fluctuations in the experience from year to year may not occur. In view of these considerations, an area within a radius of 6 miles from the headquarters of the Society may be found suitable. This will mean an area of nearly 100 sq. miles for each society. It may be suggested that three societies may be started in each rural centre mentioned above and, as indicated in the foreoging paragraph, we may proceed on the assumption of an average participation of 1500 animals in each such centre. An urban centre could perhaps be worked as a single society and here too a participation of 1500 animals may be assumed. It will be noticed that six rural and six urban centres have been suggested above. The average area of a village varies widely from province to province. In Madras and Bombay, it is nearly 3½ sq. miles. In these provinces, the area comprised in each rural centre will comprise nearly 90 villages, so that each society will operate in about 30 contiguous villages; and each village will have on an average about 17 insured animals.

13. The lines on which such a society should work have been described in the preceding chapters. In particular, it has been suggested that the additional form of contract of the form of an Endowment Assurance, described in Chapter III, will have considerable attractions in India, as compared with the usual term insurance contract. Perhaps, in the interests of simplicity of working as well as from the point of view of avoiding certain form of selectivity that might otherwise arise, it might be preferred to permit only one type of contract in each centre. The economic condition of the average cattle owner in each centre may be a relevant consideration in selecting the type of contract, since the suggested form of contract is largely in the nature of a savings scheme and will demand higher premiums. However, while the participation in insurance in such centres may be smaller, the average premium will be much higher. The choice between the contracts may be made to depend on local preferences.

(b) Forms of State aid to Societies.

14. It has been pointed out that even if Cattle Insurance is administered through cooperative societies, it will be necessary for the success of the scheme that government should help such societies in various ways during the initial period. The nature of such help has already been indicated in the preceding chapter. The following discussion will help to bring together these suggestions and to make them more definite.

1. The bye-laws should provide for regular and compulsory protection by vaccination of each insured animal against rinderpest by the Serum Simultaneous method and against other diseases where those diseases are of most frequent occurrence.

The Government should undertake the work of protecting the insured animals without any charges for inoculation serum, etc.

2. The officers of the veterinary department should be instructed to provide prompt and effective treatment to the insured animals in case of illness. The veterinary officers may also be asked to examine the animals at entry free of charge. No charges for travelling allowances, etc., should be made. The byelaws may provide that the officers of the Veterinary and Animal Husbandry Departments should be members of the Managing Committee of the Societies. In order that effective veterinary help may be possible, the number of veterinary assistants or stockmen in the area of the operation of the scheme may be increased, if necessary.

3. Government may make an annual grant to each Society for Secretarial expenses during the pilot scheme stage. In case of rural societies, the maximum grant for this purpose may be fixed at 1% of the value of the animals or Rs.480/-, whichever is smaller. In case of an urban society, a grant of Rs.900/- may be made. The maximum amount payable in any year in this connection, in respect of the 18 rural societies and 6 urban societies will therefore be nearly Rs.14,000/-.

4. It will also be desirable that government may help in creating confidence in the minds of the insured cattle-owners that the benefits promised under the contract will be forthcoming when

due. It has been pointed out that under the normal type of reinsurance, only a proportion of the benefits is guaranteed by the reinsuring body. It will be desirable to extend the guarantee in some form to the remainder of the benefit as well. The following procedure for achieving these objectives may be suggested:

Government may itself reinsure a part of the contract, such as one-half, on receiving a corresponding part of the premium received by the primary society.

In addition to this, Government may give an Establishment Grant to each society at its inception to serve as a nucleus of a reserve fund; and further, also promise interest-free loans to the societies during years of extraordinarily heavy claims.

Each society may in addition provide for a suitable share capital in its byelaws with shares of small demominations such as Re. 1 or 2. It may be provided that a member must buy at least one share in respect of each animal insured by him. The total initial reserve fund will therefore consist of the Establishment Grant and the share capital of the society.

It will be remembered that the reserve fund will be necessary to cover fluctuations in experience in respect of one half of the insured risk. A suitable amount of establishment grant may be Rs.750/- for each rural society and Rs.1250/- for each urban society. It will be noted that, in addition to this, as it is proposed to pay a recurring grant for annual expenses of the society, the proportion of the premiums intended as provision for expenses will also go to the reserve fund; it may be expected, therefore, that at the end of 5 years, the society may be in a position to meet the fluctuations in claim experience without government help. The total value of the non-recurring grants will be Rs.21,000.

### (c) Administrative machinery and its cost.

15. Turning next to the question of a suitable staff for adminstration of the state part of the programme, it may be noted that it will in any case be desirable to put a special full-time officer in charge of the operations of the Cattle Insurance programme in each province. As has been pointed out earlier, the scheme must require considerable propaganda and publicity for its successful operation

and a full-time officer will alone be able to devote sufficient attention to this aspect of the problem. The officer will be in charge of administration of reinsurance with the help of suitable clerical assistance. It will be necessary that the officer should be acquainted with the principles of insurance and cooperative organisation. In addition, it would also be desirable to obtain for this work the services of a person with veterinary qualifications. In fact, it is essential for the effective working of the scheme that more veterinary help than is at present available through the agencies of the veterinary department should be available to the societies in course of their day to day working. As has pointed out elsewhere, at present there is generally a veterinary assistant surgeon for an area equal to a taluk or a larger area. It is unlikely that the help which such an officer could give would be adequate for the purposes in view. In these circumstances, the ideal arrangement would of course be to place a special veterinary officer in the area of operation of the scheme for the purpose of giving the necessary technical aid to the Cattle Insurance Society. Perhaps, the veterinary deparments concerned could be pursuaded to do so. This officer could then be a member of the Valuation Committee of each society operating in the area. It will also be desirable to increase the number of stockmen in the area so that a stockman may be available within a distance of 3 to 6 miles to every cattle-owner. Another alternative is that the cattle insurance organisation may itself include two officers, one insurance officer and one veterinary officer. However, in view of the small scale of operations visualised in each centre this may not be considered necessary. The next alternative would therefore be that the Cattle Insurance Officer should himself be a veterinarian and should work in close association with the veterinary department concerned. Besides promoting formation of cattle insurance societies in the area, organising publicity and propaganda, and administering reinsurance in the respective centres, it could also be laid down that this officer should be ex-officio a member of the Managing Committee and the Valuation Committee of each society in the area. This will enable him to watch and guide the operations of each society from within, as is desirable in view of the considerable degree of government participation in the scheme. In addition to this, veterinary departments may be pursuaded to increase the number of stockmen in the area, if necessary, so that a stockman will be available within easy access. The Cattle Insurance Officer may be given the help of a clerk and a peon.

The Provincial staff in the various centres will operate as branch offices of a Central office. This Central Office may be put in charge of a Manager of Cattle Insurance and he may be guided by a suitable committee which will decide matters of policy. The Central Office will coordinate and supervise the working of the various centres and, review work periodically and decide matters of policy, plan the collection and analysis of statistics, maintain accounts, etc. A suitable staff at the Central Office may consist of a Manager, an Accountant, two clerks, one stenographer and two peons. Pherhaps, if a Crop Insurance Scheme is also operated simultaneously the same Central office may be responsible for the operation of both the schemes. In this case considerable economies in cost of the Central machinery will result.

On the basis described above, estimates of annual cost of the administrative machinery have been obtained in appendix I. These may be summarised as follows:

| | |
|---|---|
| Annual Cost of the provincial administrative staff. | Rs.40,000/- |
| Annual cost of the Central office staff. | Rs.25,000/- |
| Total Cost. | Rs.65,000/- |

(d) An estimate of the maximum amount of loans

It may be difficult to provide an estimate of the maximum amount that government may have to advance by way of loans during the pilot scheme stage. It may be expected that apart from catastrophes such as floods or famines, these loans will be necessary largely to meet extraordinary claims due to epidemics. However, a demand for loans will arise only after the societies' own extra resources are exhausted; and moreover, the liability in respect of one half of the claims will only be met by the societies. The statistics of deaths due to contagious diseases are not reliable; the following annual rates for various provinces have been obtained on the basis of all reported deaths during the period 1925 to 1940.

| Madras | Bombay | C.P. & Berar | Bihar & Orissa | U.P. |
|---|---|---|---|---|
| .28% | .19% | .19% | .095% | .12% |

The average mortality for these provinces works out at .17%. The province which yields the heaviest rate among those mentioned above is Madras. This may mean either a heavier mortality or a more efficient system of reporting deaths. Results of an investigation into the incidence of mortality due to contagious diseases in the Province of Madras have been given in Appendix A. It will be seen from this that mortality in the province varies considerably from district to district and also from year to year. During the period 1930-31 to 1939-40 the reported deaths due to all contagious diseases and due to rinderpest expressed as a percentage of the population according to the 1935 Census, were as follows:

| Year | 1930-31 | 1931-32 | 1932-33 | 1933-34 | 1934-35 | 1935-36 | 1936-37 | 1937-38 | 1938-39 | 1939-40 |
|---|---|---|---|---|---|---|---|---|---|---|
| All contagious diseases. | .41 | .23 | .16 | .13 | .11 | .094 | .14 | .17 | .13 | .13 |
| Rinderpest | .24 | .12 | .05 | .02 | .01 | .01 | .02 | .03 | .04 | .05 |

The variations from year to year are largely due to the variations in the incidence of rinderpest. The annual administration report of the Madras Veterinary department for 1936-37 points out that "from the records of the past 40 years it has been found that this disease breaks out in regular waves at intervals of 10 years." It will be seen that during the 10 year period the worst year should an average mortality of .41% while the worst quinquennium showed an average mortality of .21%. It may be pointed out further that mortality is heavy only in certain areas of the province. This may be seen from the following classification of the districts according to mortality experienced during the same decennium.

| Mortality per 1000 bovines. | Districts. |
|---|---|
| 0-1.49 | Ramnad, Coimbatore Tinnevelly, South Kanara, South Arcot Madura, Trichinopally, Salem, Tanjore, Malabad. |

| 1. | 2. |
|---|---|
| 1.50 - 2.49 | Anantpur, Bellary, East Godavari, N. Arcot, West Godavari, Chittoor, Vizagapattam, Cuiappah, Chingleput, Kistna. |
| 2.50 and above | Nilgiris, Madras, Nellore, Kurnool, Guntur. |

It will be seen from this that there are well-marked regions of high and low mortality due to contagious disease and by selecting areas for the operation of the scheme suitably, a mortality experience much more favourable than that indicated by the average mortality rate for the whole province could be easily ensured. It will be noted also, that since each insured animal will be protected aginst rinderpest, the major source of unusual fluctuations in the experience will be to a large extent controlled.

Taking all these factors into account, it may perhaps be suggested that in a scheme which is intended to operate on an all-India basis the demands for loans need not exceed 1% of the insured value in any one year of the period. It will be remembered that provision will also be made for repayments of the loans out of the net profits. A maximum liability of nearly 4% of the insured amount retained by the society or Rs.50,000 may, therefore, provide a broad upper limit to the sum that may be needed for payment of such advances over a period of 5 years.

(e) Summary of the operations of the scheme.

17. In the light of the foregoing discussion of the various aspects of the proposed scheme, a picture of the actual operations of the scheme may now be presented.

It may be assumed that the average value of an insured animal will be Rs.300/-. In the present circumstances this may be taken as a conservative estimate. It may be assumed further that the animal will be insured for a sum equal to two-thirds of its value, and that the premium will be equal to 5% of the value or 7½% of the insured amount. We may assume also that the average mortality rate would be 6%, so that out of an average premium of Rs.15, Rs.12 will be needed to meet the risk. Lastly, it will be assumed that half the risk is reinsured on payment of half the premium.

(a) The reinsurance scheme will operate as follows:

| | |
|---|---|
| Number of animals reinsured: | Rs. 18,000 |
| Sum reinsured @ Rs. 100 per animal | Rs. 18,00,000 |
| Annual Reinsurance premiums received @ Rs. 7/8/- per animal. | Rs. 1,35,000 |
| Annual reinsurance claims | Rs. 1,08,000 |
| Balance of reinsurance premiums over reinsurance claims. | Rs. 27,000 |

(b) The total annual expenditure of the scheme will be as follows:

| | |
|---|---|
| Annual expenditure on the administrative staff. | Rs. 65,000 |
| Grants to societies for Secretarial expenses | Rs. 14,000 |
| | Rs. 79,000 |

In addition to this, provision will have to be made for the cost of printing and stationery, publicity, etc. The total annual expenditure may therefore be taken as Rs. 90,000.

(c) The non-recurring items of expenditure will consist of Establishment Grants made to the various societies. As pointed out above this will mean an expenditure of Rs. 21,000.

(d) In addition to this, it may be necessary, to make interest free loans to the societies. The maximum amount of such advances has been estimated as Rs. 50,000/- over a period of 5 years.

(f) An alternative Procedure.

18. In the foregoing discussion, a regular reinsurance machinery administered by the State has been visualised. An alternative procedure may be also possible. This may consist in giving establishment grants to the Societies of double the size indicated above and a promise of loans to the societies in years of extraordinary claims; larger loans will now be needed since the entire benefit and not only the portion of it which is retained by the society will have to be covered. It may be remembered, however, that special planning officers in each centre will even then be necessary and it is suggested that it will be desirable in view of the objectives of a pilot scheme that government should have a complete and detailed picture of its working, such as will be possible if it participates in the working of the scheme by way of reinsurance.

## ORGANISATION FOR A COMPLETELY STATE-MANAGED SCHEME

19. It has been pointed out that a completely state managed scheme will have considerable advantages. It is clear that with a scheme of this nature the form of administrative machinery would be considerably simplified and the need for guaranteeing benefits promised by the individual societies, through reinsurance facilities and subsidies, would not arise.

20. In this case, each rural and urban centre may be administered as one unit A Cattle Insurance Officer, who should be a veterinarian, may be placed in charg of each such unit, and given the help of a clerk and a peon. It will be remembered that each centre is intended to comprise an area of nearly 300 sq. miles, so that the officer could be stationed so as to be available at a distance of less than 10 miles to the insured cattle-owners. In view of the need for effective supervision and availability of a representative of the insurer within easy access of the insured cattle owner, this area must be considered too large. It is desirable, therefore, that each centre should be divided into 3 or 4 sub-centres; a stockman placed in each sub-centre may carry out all the field functions in connection with Cattle Insurance. Assuming that three stockmen are placed in each Centre, each will be responsible for an area within a radius of about 6 miles, comprising of about 30 villages. There will be only about 500 insured animals within each such area and full-time services of the stockmen would not be required for the work. It is suggested, therefore, that the stockmen may form part of the normal field staff of the veterinary departments concerned. The existing number of stockmen may be increased for the purpose, if necessary, and they may be paid a small honorarium for the work in connection with Cattle Insurance.

21. One of the functions of the Cattle Insurance Officer will be to organise publicity and selling of insurance. For this purpose he may appoint agents on a commission basis. The agents may be individuals or cooperative societies. A suitable rate of commission during the early years of the scheme will be one anna in a rupee of the premium income. On the basis outlined earlier, this would mean a total maximum payment for commission equal to Rs. 16,875. It may be suggested also, that as an incentive for the Cattle Insurance Officer to secure the greatest possible participation, a part of his salary may be made to depend on the number of insurances in force. Thus an average salary of Rs. 200/-, may

be replaced by a fixed salary of Rs.150/- plus a commission based on the sum insured which on the basis of the expected degree of participation would be equivalent to Rs.50/-

In connection with the actual administration of Cattle Insurance, the officer will examine the insured animals and value them once in every six months. He will also arrange for protection of the insured animals against contagious disease in cooperation with the officers of the veterinary department. The work of examination and valuation may be done by the officer and the stockman concerned; but it may be useful, in addition, to associate an expert cattle owner belonging to the respective areas with the work of valuation. Where there are popular bodies like the Panchayats, such persons might be nominated on their recommendation. Such persons may be paid an honorarium in return for their services; a remuneration at the rate of 2 as. for each valuation of an animal, may be suggested. Assuming that animals are valued twice a year, a total sum of Rs.375/- will be paid in each centre and the total cost of this item of expenditure will therefore be Rs.4,500/- .

Another important part of the work of administration will be in respect of admission of claims. Under a state-managed scheme particular care will be necessary to avoid fraud in this connection. The provisions for immediate reporting of illness and inspection of the insured animals will have to be strictly enforced, so that previous reports in respect of dead animals may be available. It is essential that the dead animal should be identified, and that sufficient assurance be obtained that death has not resulted from malfeasance or neglect of any sort. Further, this must be done immediately after death is reported. It may be therefore difficult to ensure that the Cattle Insurance Officer could inspect every dead animal. It may be suggested therefore that a panel of persons of standing and experience about cattle may be appointed in each centre and it should be provided that, in the event of a claim, the cattle owner should get the death vouched and certified by at least one member of this panel. A fee of Rs.2/- may be paid by the insurer to such persons in respect of each such certificate. Assuming that there are about 90 deaths in each centre every year, the fees will be Rs.180/- if only one certificate is insisted upon. It may be remembered that is usual to provide that in the event of a claim, the hide and bones belong to the insurer. The cost of certification of deaths may be met out of the proceeds from this source.

Intimation of ill-health of the insured animals will be given directly to the stockman in charge and he will inspect the animal, report to the officer and arrange for treatment if necessary. In case of an outbreak of contagious disease the Cattle Insurance Officer will personally arrange for prompt and effective measures to be taken with the help of the stockman concerned and other officers of the veterinary department.

22. The office of the Cattle Insurance Officer will act as a Branch Office of the Central Office to which the Cattle Insurance Officer will be responsible. The same form of organisation of the Central Office as that suggested in the case of a reinsurance scheme may be adequate for a scheme on the present basis.

23. A suitable form of honorarium to the stockmen for their work in connection with Cattle Insurance may also be suggested. A remuneration of 4 as. per annum per animal insured will mean a sum of nearly Rs.10 per month to each stockman on the basis of expected degree of participation. The total cost of this will turn out to be Rs.4,500/-.

The annual cost of the administrative staff has been estimated in Appendix I at Rs. 85,000.

In addition to this, the advisability of appointing a special Cattle Insurance Organiser in each province for an initial period of two years for organising the selling of insurance, propaganda and publicity may also be considered.

24. The operations of the scheme may therefore be summarised as follows:

(a)

| | |
|---|---|
| Number of insured animals. | Rs. 18,000 |
| Sum assured | Rs. 36,00,000 |
| Annual premium income | Rs. 2,70,000 |
| Annual amount of claims | Rs. 2,16,000 |
| Balance of premiums over claims | Rs. 54,000 |

(b) The various items of expenditure will be as follows:

| | |
|---|---|
| Cost of full-time administrative staff | Rs. 85,000 |
| Honorarium paid to stockmen | Rs. 4,500 |
| Honrarium paid to valuers | Rs. 4,500 |
| Commission to agents | Rs. 17,000 |
| | Rs.1,11,000 |

In addition an allowance will have to be made for the cost of printing publicity, etc.

## CATTLE INSURANCE AFTER THE PILOT SCHEME STAGE

25. Before concluding the discussion of the various aspects of a pilot scheme of Cattle Insurance, it will be useful to visualise the later stages through which Cattle Insurance might develop in Indian conditions. As pointed out earlier, the pilot scheme might form a preliminary stage for a comprehensive scheme organised in a variety of ways. In the ultimate stage Cattle Insurance may be organised on a purely provincial basis or it may continue to be organised as a single programme on an all-India basis. Also, it may be administered through cooperative societies as primary administrative units, with reinsurance facilities provided by unions of such cooperative societies at different levels, or by the state or by private companies. It is also possible to visualise a purely state-managed scheme. The experience provided by the pilot scheme will be of value whatever form the final scheme takes.

26. One point of view from which the ultimate stage could be considered would be whether and to what extent a scheme of Cattle Insurance could be made self-supporting. As has been pointed out, even if the scheme is managed through cooperative societies, government will have to help such societies with the necessary veterinary facilities. It will be desirable to consider this as an integral part of the programme of cattle improvement and disease control of the provincial governments and to give such facilities free of cost. In order that the necessary help may be adequately given, it will be necessary to increase the present veterinary staff to a considerable extent. While such expansion might be already visualised as part of the development plans of the various provincial governments, it is clear that the rate of expansion may be slow, depending partly on the rate at which trained personnel become available. It may be assumed, therefore, that a scheme of Cattle Insurance may have to be expanded gradually from one district to another. As was pointed out earlier, the Royal Commission on Agriculture pointed out the desirability of a veterinary assistant surgeon for every 25,000 heads of cattle. In case of Madras,e.g., this may mean roughly one such surgeon for every 150 sq. miles and the suggestion will involve increasing the existing staff nearly threefold. Assuming that before a Cattle Insurance Scheme is operated there may have to be at least one veterinary assistant whthin a radius of 10 miles, i.e. an area of nearly 300 sq. miles and one stockman or livestock supervisor within a radius of six miles or an area of nearly 100 sq. miles, this would

mean in a district of 4,500 sq. miles 15 veterinary assistants and 45 livestock supervisors. Nearly 45 rural Cattle Insurance Societies may operate in such a district. Apart from the veterinary help, the other forms of help that will need to be given to societies will be of a temporary character and may be confined to a period of 5 years. When an entire district or neighbouring districts are covered by a net-work of Societies, reinsurance unions of such societies may be formed to provide reinsurance facilities and these may in their turn be re-insured at higher levels. So long as the operations are confined to only a district or two in each province, there would appear to be a case for a re-insurance system on an all-India basis rather than on a provincial basis. In case of a scheme managed through Cattle Insurance Societies, the actual administration will be done largely by honorary office-holders and the payment to the secretary could in case of a society of adequate size come out of the premiums. Even if government accepts the responsibility of providing reinsurance, a single officer for a province with adequate clerical assistance will suffice for the purpose; and perhaps, the district veterinary officer might himself be able to undertake the work.

27. It may be worthwhile considering also whether a purely state-managed scheme could be entirely self- supporting. For this purpose, it would be necessary to consider the degree of participation that may be possible in the ultimate form of the scheme. Assuming that in the ultimate stage of a voluntary scheme, 30% of the animals participate, we may assume as above an average participation of 4,500 animals in a centre of an area of 300 sq. miles. We may assume, further, that a full-time veterinary officer is placed in charge of a centre of nearly 300 sq. miles and given the help of two clerks and one peon. The commission payable to agents may now be reduced, since a large number of the insured will have merely renewed their policies. The honorarium payable to the stockmen will now represent a substantial portion of their salary and could be expressed as part of the salary. On this basis, the items of expenditure may be summarised as follows:

| | |
|---|---|
| Salaries and allowances of staff consisting of a Cattle Insurance Officer, two clerks and one peon. | Rs.6,200 |
| Honorarium paid to the stockmen @ 4 as. per policy | Rs.1,125 |
| Honorarium to the valuers | Rs.1,125 |
| Commission to agents at 3 1/8% of the premium income | Rs.2,100 |
| | Rs.10,550 |

The working of the scheme in a centre will therefore be as follows:

| | |
|---|---|
| Number of policies | Rs. 4,500 |
| Sum assured. | Rs. 9,00,000 |
| Annual Premium Income | Rs. 67,500 |
| Annual claims | Rs. 54,000 |
| Balance of premiums over claims | Rs. 13,500 |
| Total administrative expenses at the centre. | Rs. 10,550 |

Assuming that a district of 4,500 sq. miles contains 9 such centres the total number of insured animals in such districts will nearly 40,000 and the administrative expenses on the above basis will be nearly Rs. 100,000.

28. The foregoing discussion of the cost of administration of Cattle Insurance, may be summarised by saying that a loading of 20% in the premiums may suffice for making the scheme self-supporting provided the degree of participation visualised materialises. It could be suggested that in view of benefits that Cattle Insurance can bring, and the inability of the insured to pay heavy premiums, a part or whole of the administrative expenses may be borne by the government. The foregoing discussion may help to give an idea of the extent of the necessary administrative expenses. It may be pointed out, in particular, that when the staff of the veterinary department expands to an extent visualised by the Royal Commission on Agriculture, the functions of Cattle Insurance could be assigned to the officers as part of their normal work and the cost of insurance would then be substantially reduced.

29. The foregoing discussion should also be of help in judging the costs of administration of the pilot scheme in a correct perspective. It is clear that in view of the small scale of operations in each area and the limited extent of participation which could be expected during the early stages of the scheme, the expenses of administration will form a relatively larger proportion of the premium income than may be the case in ultimate stages of the scheme. This is inevitable in case of any scheme of a limited scope with its operations spread over different provinces and in judging the cost of the scheme the ultimate position must be kept in view.

## CATTLE INSURANCE AND CROP INSURANCE

30. A complete scheme of agricultural insurance should comprise both Cattle Insurance and all-risk Crop Insurance, so that insurance protection may be available to the insured cultivator in respect of his periodical income as well as working capital. It is clear that guarantee of a minimum income in all seasons through a Crop Insurance scheme should enable the cattle-owner to keep his cattle insured even during years of agricultural distress and would prevent heavy fall in business or lapses occurring during such years; further, this will ensure that the insured cattle do not die of starvation and neglect during such years, owing to the inability of the cultivator to maintain them. The working of the two schemes in identical areas may,therefore,have certain advantages. This point may be borne in mind in selecting areas for operation of the two schemes. However, from the point of view of the administrative agencies which operate the scheme, there are obvious advantages in administering the Crop Insurance scheme through the primary field agencies of the Revenue Department and Agricultural Department, while agencies of the Veterinary Department could be more appropriately associated with the administration of the Cattle Insurance Scheme. Never-the-less, if both schemes are worked simultaneously, a single Central Office could direct policies and coordinate the working of the two schemes. It will also be possible to place a single officer of a higher status than that visualised above, in charge of both the schemes in a province, and the work of organising the selling of insurance and publicity may be entrusted to him in addition to the general supervision of the working of the two schemes in the province.

.....

# APPENDIX I

## TO CHAPTER VII

(a) Cost of administration in case of a scheme administered through Cattle Insurance Societies.

(i) Cost of the Provincial administrative staff:

| | |
|---|---|
| 8 Cattle Insurance Officers @ 200/- p.m. each including allowances. | Rs. 1,600 p.m. |
| 8 clerks @ 100 p.m. including allowances. | Rs. 800 p.m. |
| 8 peons @ 50 p.m. including allowances. | Rs. 400 p.m. |
| Total monthly salaries. | Rs. 2,800 |
| Total annual salary | Rs.33,600 |
| Travelling allowances and contingencies per annum | Rs. 6,400 |
| Total annual cost | Rs.40,000 |

(ii) Cost of the Central Staff:

| | |
|---|---|
| Manager @ Rs.800/- p.m. including allowances. | Rs. 800 p.m. |
| An Accountant @ Rs.400/- p.m. including allowances. | Rs. 400 p.m. |
| Two clerks and one computor each @ 100 p.m. including allowances | Rs. 300 p.m. |
| A stenographer including allowances. | Rs. 200 p.m. |
| Two peons each @ Rs.50 p.m. including allowances | Rs. 100 p.m. |
| Total salaries per month. | Rs. 1,800 p.m. |
| Total salaries per annum | Rs.21, 600 |
| T.A. & contingencies per annum | Rs. 4, 400 |
| Total Annual Cost | Rs.25,000 |

(b) Cost of administration in case of an entirely state-managed scheme:

(i) Cost of the Provincial administrative staff:

| | |
|---|---|
| 12 Cattle Insurance Officers each @ 300 p.m. including allowances. | Rs. 2,400 p.m. |
| 12 clerks each @ 100 p.m. including allowances. | Rs. 1,200 p.m . |
| 12 peons @ 50 p.m. including allowances. | Rs. 600 p.m. |
| Total monthly salaries. | Rs. 4,200 p.m. |

| | |
|---|---|
| Total annual salary bill. | Rs.50,400 |
| Travelling allowance & contingencies per annum | Rs. 9,600 |
| Total annual cost. | Rs.60,000 |
| (ii) Cost of the Central administrative staff, as in case of (a) above. | Rs.25,000 |

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## APPENDIX II TO CHAPTER VII

### POPULATION OF CATTLE IN CERTAIN URBAN CENTRES AND IN SURROUNDING AREAS ACCORDING TO 1945 CATTLE CENSUS

(Figures in thousands)

| DISTRICT | OXEN | | | BUFFALOES | | | TOTAL BOVINE |
|---|---|---|---|---|---|---|---|
| | TOTAL MALES OVER 3 YRS. | TOTAL FEMALES OVER 3 YEARS | YOUNG STOCK 3 & UNDER | TOTAL MALE OVER 3 YEARS | TOTAL FEMALE OVER THREE YEARS. | YOUNG STOCK THREE YEARS AND UNDER. | |
| DELHI | | | | | | | |
| Urban | 7 | 4 | 5 | (a) | 4 | 3 | 23 |
| Rural | 34 | 25 | 35 | 1 | 35 | 29 | 159 |
| Total | 41 | 29 | 40 | 1 | 39 | 32 | 182 |
| CAWNPORE | | | | | | | |
| Urban | 2 | 6 | 5 | 1 | 3 | 1 | 18 |
| Rural | 173 | 146 | 154 | 55 | 119 | 96 | 743 |
| Total | 175 | 152 | 159 | 56 | 122 | 97 | 761 |
| BOMBAY | | | | | | | |
| Urban | 7 | 2 | 1 | (a) | 19 | 3 | 32 |
| BOMBAY SUBURBS | | | | | | | |
| Urban | 3 | 3 | 2 | (a) | 22 | 1 | 31 |
| Rural | 3 | 1 | 1 | 1 | 3 | 1 | 10 |
| Total | 6 | 4 | 3 | 1 | 25 | 2 | 41 |
| KOLABA | | | | | | | |
| Urban | 3 | 2 | 1 | (a) | 1 | 1 | 8 |
| Rural | 103 | 88 | 77 | 29 | 27 | 18 | 342 |
| Total | 106 | 90 | 78 | 29 | 28 | 19 | 350 |

| 1. | 2. | 3. | 4. | 5. | 6. | 7. | 8. |
|---|---|---|---|---|---|---|---|
| MADRAS | | | | | | | |
| Urban | 2 | 3 | 2 | (a) | 4 | 1 | 12 |
| CHINGLEPUT | | | | | | | |
| Urban | 51 | 10 | 22 | 10 | 21 | 10 | 124 |
| Rural | 271 | 56 | 115 | 37 | 70 | 40 | 589 |
| Total | 322 | 66 | 137 | 47 | 91 | 50 | 713 |
| NAGPUR MUNICIPALITY | | | | | | | |
| Urban | 4 | 6 | 5 | (a) | 4 | 1 | 20 |
| NAGPUR DISTRICT OTHER AREAS NAGPUR DISTT. | | | | | | | |
| Urban | 9 | 7 | 6 | (a) | 2 | 2 | 26 |
| Rural | 184 | 161 | 147 | 2 | 30 | 21 | 545 |
| Total | 197 | 174 | 158 | 2 | 36 | 24 | 591 |
| CALCUTTA CORPORATION | | | | | | | |
| Urban | 4 | 37 | 28 | 4 | 24 | 17 | 114 |
| 24-PARGANAS | | | | | | | |
| Urban | 8 | 31 | 20 | 1 | 3 | 1 | 64 |
| Rural | 326 | 265 | 222 | 10 | 11 | 7 | 841 |
| Total | 334 | 296 | 242 | 11 | 14 | 8 | 905 |

(a) Below 500.

## APPENDIX 'A' (1)

## BOVINE MORTALITY DUE TO CONTAGIOUS DISEASE IN THE PROVINCE OF MADRAS

1. Considerable information about the incidence of contagious disease is published in the annual administration reports of the Veterinary Departments of the various provinces. As pointed out earlier, the reliability of the data contained in these reports depends on the accuracy with which outbreaks of disease and deaths are reported. It is believed that the number of deaths reported is generally far less than the actual number and that classification of deaths according to causes is also inaccurate. Nevertheless, the statistics of mortality contained in these reports may be of value for obtaining an idea of the variation of mortality between different tracts in the province from year to year. It is clear that such a study should be useful from the point of view of the pilot scheme of Cattle Insurance. Firstly, the areas of operation of the scheme may be located in the tract where mortality due to contagious diseases is comparatively lighter. Secondly, a study of variation between years of the deaths due to different diseases will provide an idea of how such variations may affect the fortunes of a Cattle Insurance fund and will indicate the diseases which will need particular attention from this point of view. A rough idea may also be obtained of the maximum number of claims that may arise in any year from such diseases in an affected area and this information could be useful for devising a suitable financial structure for the pilot scheme.

In the present note the statistics of mortality due to contagious diseases in Madras province have been studied for the period 1930-31 to 1939-40. The results of study for U.P. are given in Appendix 'A' (2). It is proposed to study data for other provinces on the same lines.

2. In Madras, the village Munsiff maintains a Cattle Mortality register in which deaths due to certain contagious and non-contagious diseases are entered with dates of occurrence. In the event of an outbreak of a contagious disease in a village, the village Munsiff is required to send a report immediately to the Tahsildar of the taluk with a copy to the touring veterinary assistant surgeon. The initial outbreak

report is followed by weekly progress reports until the disease subsides. With regard to mortality statistics the village Munsiffs send monthly mortality returns to the tahsildar who forwards them to the Collector of the district, who in his turn sends the consolidated monthly return for the district to the Director of Veterinary Services. Owing to the indifference on the part of the village Munsiff and his inability to differentiate between the diseases, it is believed that the reporting is incomplete and that deaths are wrongly classified. There is a large number of unregistered attacks and the delay in reporting attacks is considerable. In 1936, the Government of Madras examined the question and considered that the efficiency of reporting would be greatly enhanced by enlisting the cooperation of other departments and private bodies. Presidents of village panchayats, forest panchayats and irrigation boards were entrusted with the work of reporting outbreaks of cattle disease within five miles of their own villages. The number of such reports received is small but the position is likely to improve in future.

3. Table I summarises the information about the reported mortality due to the various diseases in the province as a whole, during the period 1930-31 and 1939-40.

It will be seen that in Madras, the major diseases in order of importance from the point of view of actual deaths are rinderpest, blackquarter and haemorrhagic septicaemia. The proportions of deaths due to all contagious diseases which are accounted for by each of these diseases are respectively 35%, 18% and 15%. To obtain an idea of the seriousness of the losses caused by such diseases, the deaths should be related to the total cattle population in the province during the period. For this purpose the population as shown by the 1934-35 Census has been utilised. The rates so obtained are as follows: Rinderpest, 0.06%; Blackquarter0.031%; Haemorrhaegic Septicaemia,0.025%; and all contagious diseases, 0.169%. An idea of the relative virulence of the attacks of the various diseases may be also be obtained from this table. It will be seen that while numbersof deaths per outbreak of rinderpest, black-quarter and haemorrhagic septicaemia are comparable, being respectively 20, 14 and 17, the number of deaths per outbreak of anthrax is much higher, viz. 85. On the other hand the average number of villages affected every year by these four diseases are respectively 1062, 877, 727 and 84, so that anthrax is comparatively rare in occurrence. The figures of the cattle population of the affected villages are given during the quinquennium ending 1940-41. Assuming that the average population of an affected village for each disease during these years will also roughly apply to the remaining years of the period, the mortality per 1000 cattle in the affected villages due to the four diseases specified above is respectively 19, 17, 15 and 59. These figures may give some idea of the extent of losses to be expected in case an epidemic occurs in a centre in which cattle insurance is administered.

4. Another important feature will be the nature of the variation in the mortality due to a contagious disease from year to year. It has been pointed out that rinderpest is a disease which though always present in some parts of the country has waves of virulence from time to time which take three or four years to reach their crest. It is pointed out in the annual administration report of the Veterinary Department of Madras for the year 1936-37, on the basis of the records of 40 years prior to the year of report, that rinderpest breaks out in the province in regular waves at intervals of 10 years. On the other hand the number of annual deaths from other contagious diseases has remained fairly stationary from year to year. This may be seen to some extent from the coefficients of variability of the number of deaths from year to year due to each disease, given in Table I. These are as follows: Rinderpest: 111; Blackquarter: 26; Haemorrhagic Septicaemia: 13; Anthrax: 27. A fuller picture may be obtained from table II in which the variations are shown from year to year. It will be seen that rinderpest mortality steadily decreases from 2.41 per thousand in 1930-31 to 0.11 per thousand in 1935-36 and then steadily rises to .54 in 1939-40. It ranges from 2.41 in 1930-31 to 0.11 in 1935-36 with an average of 0.60. On the other hand, blackquarter mortality per thousand varies from 0.19 to 0.40 with an average of 0.31: that due to haemorrhagic septicaemia from 0.18 to 0.31 with an average of 0.25; and that due to anthrax from 0.09 to 0.20 with an average of 0.14.

The following figures for the mortality due to rinderpest relating to a longer period would be of value for indicating the nature of the variation of the mortality due to this disease.

| Year | 1930-31 | 1931-32 | 1932-33 | 1933-34 | 1934-35 |
|---|---|---|---|---|---|
| Deaths per 1000 bovines | 2.41 | 1.15 | 0.52 | 0.21 | 0.13 |
| 1935-36 | 1936-37 | 1937-38 | 1938-39 | 1939-40 | 1940-41 |
| 0.11 | 0.21 | 0.32 | 0.41 | 0.54 | 0.73 |
| 1941-42 | 1942-43 | 1943-44 | 1944-45 | 1945-46 | 1946-47 |
| 0.57 | 0.53 | 1.78 | 1.18 | 0.52 | 0.22 |

It will be seen from this that the widest fluctuations in the mortality experience of the fund as a whole may be expected to occur as a result of rinderpest. If provision is made for regular and compulsory immunisation of all insured animals by the Serum Simultaneous method, which is known to provide immunity for a considerable period of years, the adverse effects of contagious dieseases on the working of the scheme will be minimised to a large extent.

5. Another interesting viewpoint from which the data could be studied relates to the variation in the incidence of disease in different areas. Figures bearing on this point are presented in Table III. It will be seen that different districts vary considerably from the point of view of their suceptibility to contagious disease. On the basis of the susceptibility to all contagious diseases the various districts may be grouped as follows:-

| MORTALITY PER 1000 BOVINES. | DISTRICTS |
|---|---|
| 0 - 1.49 | Ramnad, Coimbatore Tinnevelly, South Kanara, South Arcot Madura, Trichinopally, Salem, Tanjore, Malabar. |
| 1.50 - 2.49 | Anantpur, Bellary, East Godavari, N. Arcot, West Godavari, Chittoor, Vizagapattam, Cudappah, Chingleput, Kistna. |
| 2.50 and above | Nilgiris, Madras, Nellore, Kurnool, Guntur. |

It will be seen from the above, that there are well-marked regions in the province where the mortality due to contagious disease is over-average and under-average. Frequent outbreaks of rinderpest are known to be usually confined to the districts of the province bordering on other provinces and states, viz. Vizagapatam, East and West Godavari, Kistna, Guntur. On the other hand the Central and Southern districts are known to be comparatively free from such outbreaks.

The districts of high and low incidence of the various diseases are also indicated by the Table III. Five districts with the highest average mortality and five with the lowest mortality are shown below in respect of each disease.

Rinderpest High: Madras (2.95), Kurnool (2.27), Guntur (1.43) Nellore (1.39), Kistna (1.24)
Low : Coimbatore (.05), Ramnad (.07), Salem (.11), Madura (.18), Nilgiris (.22)

Anthrax: High: Guntur (.85), W.Godavari (.44), Nellore (.41), Kurnool (.37), East Godavari (.27)
Low : Ramand (.03), Tinnevelly (.04), South Kanara (.04) Salem (.05), Tanjore (.05)

Haemorrahaegic Septicaemia High Nilgiris (.84), Chingleput (0.79), Nellore (.64), Kistna (0.49), Guntur (0.47)
Low: Coimbatore (.04), Madura (.05), Ramnad (.07) Chitoor (.08), S. Kanara (.09), Anantapur (.09)

Blackquarter
High: Chittoor (1.01), Anantapur (.80), Salem (0.64) Nellore (0.51), Cuddappah (0.46)
Low Madras (.01), S. Kanara (.01), West Godavari (.05) Kistna (.07), Malabar (.07)

From the above, the tendency for high risk and low risk districts to be identical in case of Rinderpest, Anthrax and Haemorrhaegic Septicaemia may be noticed. Guntur and Nellore are among the five high risk districts for all three, Kurnool for the first two and Kistna for the first and third. Ramnad is among the five lowest risk districts for all three; Coimbatore and Madura for first and third and Salem for the first and second. The incidence of blackquarter seems to be very different.

6. It will be also interesting for the purpose in view to trace the variations in mortality from year to year in individual districts. With this end in view figures have been given for two districts situated

in two breeding tracts in the province, viz., Guntur with a high incidence of contagious disease and Coimbatore with a low incidence. The figures are given separately for rinderpest and other dieseases. In Guntur the maximum mortality during the period occurred in 1930-31 and was equal to 1.05% of which rinderpest accoumted for .72%. The average mortality due to rinderpest in Guntur was .715% and was higher than in any other district except Madras and Kurnool. The incidence of Anthrax was also the heaviest in Guntur (.085%) and that of Haemorrhaegic Septicaemia was also high (.047%). In Coimbatore the maximum mortality equal to 0.093% occured in 1932-33 and of this rinderpest accounted for only .002%. In Coimbatore the incidence of rinderpest has been comparatively slight, the maximum rate of .026% having attained in 1931-32. The average for the period was only .005%. As will be seen from Table III, black quarter was the disease of heaviest incidence in Coimbatore with an average mortality of .029%.

7. In Table V the differential incidence of different types of contagious disease between oxen and buffaloes has been investigated for the period 1938-39 to 1940-41. So far as the figures are reliable, the mortality among oxen seems to have been consistently heavier in case of every disease other than haemorrhagic septicaemia. This is particularly noticeable in case of blackquarter and anthrax. In case of Haemorrhaegic Septicaemia, however, the mortality among buffaloes was higher in every year. It would be interesting to confirm these comparisons with reference to data relating to a longer period of years.

## T A B L E - I

Incidence of the contagious diseases among Bovines in the Madras province during the period 1930-31 to 1939-40.

| | | Rinderpest | Blackquarter | Haemorrhagic Septicaemia | Anthrax | Food mouth | Other contagious diseases | All contagious diseases. |
|---|---|---|---|---|---|---|---|---|
| 1. Number of deaths per annum during the period 1930-31 - 1939-40) | Average | 14,802 | 7,660 | 6,228 | 3,323 | 1,622 | 8,066 | 41,701 |
| | Maximum | 59,323 | 11,189 | 7,536 | 4,978 | 2,965 | 18,241 | 99,890 |
| | Minimum | 2,752 | 4,630 | 4,503 | 2,300 | 709 | 3,459 | 23,214 |
| 2. Coefficient of variability of the number of deaths. | | 111.19 | 26.20 | 13.01 | 27.32 | 19.41 | 49.49 | 51.08 |
| 3. Average number of deaths per thousand (a) bovines. | | 0.60 | 0.31 | 0.25 | 0.14 | 0.07 | 0.32 | 1.69 |
| 4. Proportion of deaths to deaths due to all causes. | | 0.35 | 0.18 | 0.15 | 0.08 | 0.04 | 0.20 | 1.00 |
| 5. Number of outbreaks per year. | Average | 752 | 537 | 373 | 39 | | | |
| | Maximum | 1,452 | 1,154 | 663 | 79 | | | |
| | Minimum | 230 | 132 | 75 | 0 | | | |
| 6. Average annual number of villages (b) affected. | | 1,062 | 877 | 727 | 84 | | | |
| 7. Number of deaths per outbreak | | 19.68 | 14.26 | 16.70 | 85.21 | | | |
| 8. Mortality per thousand (c) bovines in affected villages | | 18.93 | 17.33 | 15.30 | 59.34 | | | |

(a) Population figures relate to 1934-35 Census.
(b) Figures relate to the quinquennium endinn 1940-41.
(c) Figures for the average bovine population in affected villages for each disease during quinquennium ending 1940-41 are assumed to apply to the entire period.

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# TABLE II

Table showing for each contagious disease and in each year the following in the province of Madras

(a) Deaths per thousand bovince animals*,
(b) Number of outbreaks,
(c) Deaths per outbreak
(d) Deaths per 1000 animals in the affected villages.

| Disease | Year | 1930-31 | 1931-32 | 1932-33 | 1933-34 | 1934-35 | 1935-36 | 1936-37 | 1937-38 | 1938-39 | 1939-40 | Average for the period |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rinderpest | (a) | 2.41 | 1.15 | 0.52 | 0.21 | 0.13 | 0.11 | 0.21 | 0.32 | 0.41 | 0.54 | 0.60 |
| | (b) | 1,452 | 902 | 492 | 500 | 230 | 321 | 515 | 1003 | 914 | 1186 | 752 |
| | (c) | 40.86 | 31.50 | 25.88 | 10.42 | 14.10 | 8.57 | 9.91 | 7.95 | 10.93 | 11.19 | 19.68 |
| | | | | | | | | 9.70 | 16.49 | 6.68 | 17.25 | |
| Blackquarter | (a) | 0.34 | 0.22 | 0.38 | 0.31 | 0.26 | 0.24 | 0.32 | 0.45 | 0.40 | 0.19 | 0.31 |
| | (b) | 139 | 132 | 280 | 382 | 402 | 497 | 626 | 1154 | 1136 | 621 | 537 |
| | (c) | 60.55 | 40.59 | 33.40 | 19.76 | 15.96 | 11.78 | 12.67 | 9.70 | 8.72 | 7.46 | 14.26 |
| | (d) | | | | | | | 26.52 | 22.88 | 15.15 | 11.81 | |
| Haemorrhagic Septicaemia | (a) | 0.29 | 0.25 | 0.26 | 0.31 | 0.28 | 0.23 | 0.26 | 0.23 | 0.24 | 0.18 | 0.25 |
| | (b) | 75 | 146 | 186 | 191 | 282 | 373 | 562 | 606 | 642 | 663 | 373 |
| | (c) | 94.72 | 42.09 | 34.75 | 39.46 | 24.20 | 15.18 | 11.30 | 9.36 | 9.36 | 6.79 | 16.70 |
| | (d) | | | | | | | 19.25 | 16.43 | 15.58 | 11.55 | |
| Anthrax | (a) | 0.20 | 0.19 | 0.15 | 0.15 | 0.09 | 0.10 | 0.14 | 0.13 | 0.09 | 0.11 | 0.14 |
| | (b) | - | 13 | 21 | 23 | 26 | 54 | 79 | 64 | 44 | 65 | 39 |
| | (c) | | 364.15 | 171.67 | 157.04 | 88.46 | 44.13 | 42.27 | 51.28 | 23.05 | 40.91 | 85.21 |
| | (d) | | | | | | | 34.78 | 126.23 | 58.35 | 53.18 | |

* Population figures relate to 1934-35 Census.

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## T_A_B_L_E III

Incidence of mortality due to contagious diseases among bovines in different
province
districts of Madras/ during the period 1930-31 to 1939-40

| DISTRICT | Bovine population 1934-35 Census (Thousands) | Annual number of deaths per thousand among bovine animals due to | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Rinderpest | | | Blackquarter Average | Haemorrhagic septicaemia Average | Anthrax Average | All diseases | | |
| | | Average | Maximum | Minimum | | | | Average | Maximum | Minimum |
| 1. | 2. | 3. | 4. | 5. | 6. | 7. | 8. | 9. | 10. | 11 |
| GANJAM & VIZAGAPATAM | 2,952 | 0.40 | 1.41 | 0.08 | 0.22 | 0.25 | 0.11 | 2.01 | 4.07 | 0.56 |
| GODAVARI, EAST | 1,026 | 0.77 | 1.47 | 0.12 | 0.09 | 0.23 | 0.27 | 1.78 | 4.74 | 0.59 |
| GODAVARI, WEST | 752 | 0.95 | 2.95 | 0.13 | 0.05 | 0.18 | 0.44 | 1.86 | 3.78 | 0.80 |
| KISTNA | 949 | 1.24 | 5.68 | 0.31 | 0.07 | 0.49 | 0.10 | 2.42 | 9.03 | 1.07 |
| GUNTUR | 1,315 | 1.43 | 7.15 | 0.04 | 0.19 | 0.47 | 0.25 | 7.30 | 10.49 | 0.94 |
| KURNOOL | 674 | 2.27 | 8.47 | 0.01 | 0.42 | 0.29 | 0.37 | 3.94 | 11.14 | 0.71 |
| BELLARY | 599 | 0.65 | 1.81 | 0.005 | 0.19 | 0.17 | 0.18 | 1.52 | 3.21 | 0.31 |
| ANANTAPUR | 721 | 0.29 | 1.90 | 0.00 | 0.80 | 0.09 | 0.07 | 1.50 | 3.22 | 0.35 |
| CUDDAPAH | 580 | 0.89 | 2.38 | 0.00 | 0.46 | 0.40 | 0.22 | 2.11 | 4.15 | 0.78 |
| NELLORE | 1,184 | 1.39 | 4.42 | 0.02 | 0.51 | 0.64 | 0.41 | 3.68 | 6.22 | 1.98 |
| CHINGLEPUT | 897 | 0.56 | 2.44 | 0.03 | 0.33 | 0.79 | 0.22 | 2.14 | 5.74 | 1.15 |
| NORTH ARCOT | 1,250 | 0.72 | 5.19 | 0.00 | 0.41 | 0.20 | 0.06 | 1.81 | 6.69 | 0.42 |
| SOUTH ARCOT | 1,144 | 0.27 | 1.28 | 0.02 | 0.26 | 0.17 | 0.07 | 0.88 | 1.75 | 0.31 |
| CHITTOOR | 1,129 | 0.45 | 2.35 | 0.01 | 1.01 | 0.08 | 0.12 | 1.90 | 4.36 | 0.51 |
| SALEM | 1,498 | 0.11 | 0.91 | 0.00 | 0.64 | 0.28 | 0.05 | 1.19 | 1.99 | 0.79 |
| COIMBATORE | 1,423 | 0.05 | 0.26 | 0.00 | 0.29 | 0.04 | 0.04 | 0.52 | 9.23 | 0.26 |

| 1. | 2. | 3. | 4. | 5. | 6. | 7. | 8. | 9. | 10. | 11. |
|---|---|---|---|---|---|---|---|---|---|---|
| TRICHINOPOLY | 1,084 | 0.25 | 1.81 | 0.00 | 0.45 | 0.17 | 0.06 | 1.07 | 3.88 | 0.42 |
| TANJORE | 1,131 | 0.48 | 4.43 | 0.005 | 0.09 | 0.36 | 0.05 | 1.33 | 5.55 | 0.60 |
| MADURA | 922 | 0.18 | 1.18 | 0.02 | 0.35 | 0.16 | 0.09 | 1.01 | 1.85 | 0.69 |
| RAMNAD | 687 | 0.07 | 0.37 | 0.00 | 0.08 | 0.07 | 0.03 | 0.34 | 0.94 | 0.15 |
| TINNEVELLY | 709 | 0.31 | 1.10 | 0.00 | 0.10 | 0.10 | 0.04 | 0.60 | 1.75 | 0.15 |
| THE NILGIRIS | 55 | 0.22 | 0.85 | 0.00 | 0.11 | 0.84 | 0.09 | 2.91 | 6.71 | 0.38 |
| MALABAR | 1,082 | 0.48 | 4.10 | 0.00 | 0.07 | 0.39 | 0.24 | 1.35 | 4.72 | 0.34 |
| SOUTH KANARA | 823 | 0.50 | 2.77 | 0.04 | 0.01 | 0.09 | 0.04 | 0.76 | 3.40 | 0.17 |
| MADRAS | 19 | 2.95 | 18.32 | 0.00 | 0.01 | 0.05 | 0.12 | 3.32 | 19.05 | 0.05 |

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## T_A_B_L_E IV

## ANNUAL VARIATION IN MORTALITY IN SELECTED DISTRICTS
## IN MADRAS PROVINCE

| District | Cause | Annual mortality per1000 bovines | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1930-1 | 1931-2 | 1932-3 | 1933-4 | 1934-5 | 1935-6 | 1936-37 | 1937-8 | 1938-39 | 1939-40 |
| GUNTUR | Rinderpest | 7.15 | 4.23 | 0.76 | 0.05 | 0.04 | 0.30 | 0.46 | 0.71 | 0.23 | 0.41 |
| | Others | 3.34 | 1.20 | 1.04 | 1.19 | 0.98 | 0.65 | 1.10 | 1.02 | 0.94 | 1.36 |
| | Total | 10.49 | 5.43 | 1.80 | 1.24 | 1.02 | 0.95 | 1.56 | 1.73 | 1.17 | 1.77 |
| COIMBATORE | Rinderpest | 0.26 | 0.15 | 0.01 | 0.01 | 0.02 | - | 0.00 | - | 0.02 | - |
| | Others | 0.33 | 0.26 | 0.63 | 0.57 | 0.91 | 0.32 | 0.25 | 0.39 | 0.61 | 0.51 |
| | Total | 0.59 | 0.41 | 0.64 | 0.58 | 0.93 | 0.32 | 0.25 | 0.39 | 0.63 | 0.51 |

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## T A B L E V

Annual number of deaths due to contagious diseases among oxen and buffaloes per 1000 animals of the respective species during the period 1938-39 to 1940-41

| C A U S E | 1938-39 | | 1939-40 | | 1940-41 | | Whole period | |
|---|---|---|---|---|---|---|---|---|
| | Oxen | Buffaloes | Oxen | Buffaloes | Oxen | Buffaloes | Oxen | Buffaloes |
| Rinderpest | 0.54 | 0.22 | 0.62 | 0.56 | 0.82 | 0.77 | 0.66 | 0.52 |
| Haemorrhagic Septicaemia | 0.23 | 0.36 | 0.18 | 0.26 | 0.18 | 0.35 | 0.20 | 0.32 |
| Foot and mouth | 0.04 | 0.02 | 0.05 | 0.02 | 0.05 | 0.03 | 0.05 | 0.02 |
| Blackquarter | 0.60 | 0.06 | 0.27 | 0.05 | 0.27 | 0.06 | 0.38 | 0.06 |
| Anthrax | 0.13 | 0.04 | 0.14 | 0.07 | 0.13 | 0.09 | 0.13 | 0.07 |
| Surra | 0.07 | 0.00 | 0.02 | 0.01 | 0.02 | 0.00 | 0.04 | 0.00 |
| Other contagious diseases | 0.13 | 0.04 | 0.26 | 0.16 | 0.25 | 0.22 | 0.21 | 0.14 |
| Total | 1.74 | 0.74 | 1.54 | 1.13 | 1.72 | 1.52 | 1.67 | 1.13 |

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## APPENDIX A (2).

### A note on the incidence of contagious disease in U.P.

1. Data relating to the incidence of contagious disease available in the annual administration reports of the Civil Veterinary Department and Animal Husbandry Department in U.P., have been analysed in the present note. The main results provide interesting comparisons with the corresponding results in respect of Madras given in appendix A (1).

2. Table I (A) summarises the main results as regards the various diseases in respect of the whole province and for the whole period 1925-26 to 1939-40. It will be seen from this table that rinderpest is by far the most important disease in U.P., and accounts for 71% of the total reported mortality. From the point of view of the total mortality, the other diseases are comparatively of much less importance and account only for 10% of the mortality due to contagious diseases. The relative importance of various diseases is very different in Madras, as can be seen from the following table.

Deaths due to various diseases expressed as percentages of deaths due to all contagious diseases.

| | Rinderpest | Haemorrhagic Septicaemia. | Blackquarter | Foot & mouth disease. | Anthrax. |
|---|---|---|---|---|---|
| U.P. | | | | | |
| 1925-26 to 1939-40 | 71% | 19% | 2% | 5% | 2% |
| Madras. | | | | | |
| 1930-31 to 1939-40 | 35% | 15% | 18% | 4% | 8% |

It will be noticed that the main distinction lies in the comparatively much greater importance of rinderpest and much smaller importance of blackquarter in U.P. Anthrax also appears to be of much less importance in U.P. than in Madras. It will be noticed, however, that the relative efficiency of reporting is an important consideration in this connection. It will be seen also that rinderpest would appear to show markedly higher virulence in U.P., the mortality per thousand bovines during the quinquennium ending in 1940-41, being 47 in U.P. and 19 in Madras. It may be pointed out that this quinquennium was one of underaverage mortality due to rinderpest in both cases. There is no such disparity in the virulence of the other diseases.

3. The levels of mortality rates due to different contagious diseases in the two provinces and their variation from year to year may be compared on

the basis of tables I, II, I(A) and II(A). The following table brings together the relevant figures:

Average mortality per thousand bovines.

| | Rinderpest | Haemorrhagic Septicaemia. | Black quarter. | Foot & mouth disease. | Anthrax | All contagious diseases. |
|---|---|---|---|---|---|---|
| U.P. | | | | | | |
| 1925-26 to 1939-40 | 0.84 | 0.22 | 0.02 | 0.06 | .02 | 1.18 |
| Madras | | | | | | |
| 1930-31 to 1939-40 | 0.60 | 0.25 | 0.31 | 0.07 | 0.14 | 1.69 |

Coefficient of variability number of deaths from year to year.

| | | | | | | |
|---|---|---|---|---|---|---|
| U.P. | | | | | | |
| 1925-26 to 1939-40 | 37 | 38 | 58 | 76 | 64 | 26 |
| Madras | | | | | | |
| 1930-31 to 1939-40 | 111 | 13 | 26 | 19 | 27 | 51 |

It will seen that while the level of mortality due to all contagious diseases is higher in Madras, owing to the greater relative importance of rinderpest in U.P., the level of mortality due to rinderpest is actually lower in that province. Haemorrhagic Septicaemia and Foot and Mouth disease appear to be of equal importance in the two provinces, while rates of mortality due to blackquarter and anthrax are much lighter in U.P.

4. Another interesting feature is the nature of variation of mortality due to each cause from year to year. An idea of such variation may be obtained from the coefficients of variability shown in the foregoing table It will be seen that the variability is much larger in U.P. in case of minor diseases, while the two major diseases have the least variability in that province. Except for rinderpest, the coefficients of variability are comparatively lower in all cases in Madras. The substantially lower variation in case of rinderpest and the larger variation in case of haemorrhagic septicaemia in U.P. may repay closer scrutiny. This could be done with the help of Table II(A), which gives the trend of mortality due to each cause during the period studied. The tendency for rinderpest to show regular waves of virulence was remarked upon in case of Madras. The same tendency is clearly apparent in case of U.P., but it is much less

pronounced. In Madras, during the period 1930-31 to 1946-47, the minimum rate of mortality due to rinderpest was as low as 0.011% while the maximum attained was 0.241%, the transition from though to crest being gradual. In case of U.P., the oscillation was of much smaller amplitude. During the period 1925-26 to 1939-40, the level of rinderpest mortality never fell below 0.042% and never rose above 0.147%. Nevertheless, even in case of U.P., the tendency towards oscillatory movement is well-marked. This may be made clearer by comparing the levels of mortality during the periods 1925-26 to 1928-29 (average 0.70), 1929-30 to 1933-34 (average 1.19) 1934-35 to 1937-38 (average 0.55) and 1938-39 to 1939-40 (0.85).

The variation in the mortality due to haemorrhaegic septicaemia in U.P. during the period studied would seem to show a regularly increasing trend. This may be seen by comparing the periods 1925-26 to 1927-28 (average .097), 1928-29 to 1935-36 (average 0.22), 1936-37 to 1939-40 (average 0.32). The question of increasing efficiency of reporting may be at least a partial explanation. In any case, the trend is not maintained in the years following 1939-40, the figures for the seven years ending in 1946-47 being respectively 0.21, 0.19, 0.23, 0.15, 0.17, 0.26, 0.23. In Madras, the level of mortality rates due to this disease remained stable during the period studied.

5. In Table III(A) are presented the variations in the mortality due to different causes in the different districts of the province. It will be seen from this stable, that as in the case of Madras, there are well-defined regions in which mortality due to different diseases is light and heavy. In view of the large number of districts in which the province is divided it is not easy to visualise this at a glance. For this purpose, the districts were assigned ranks according to the rates of mortality due to all contagious diseases and according to the mortality due to rinderpest and haemorrhagic septicaemia, the rank increasing with the rate of mortality. The following table shows the ranks assigned to the various districts in the province; the figure outside the bracket relates to rank according to all contagious diseases, while the first figure within the bracket gives the rank according to rinderpest and

the second the rank according to haemorrhagic Septicaemia.

Meerut Division.
Dehra Dun 43 (45,1)
Shahranpur 39 (44,22)
Muzaffarnagar 41 (41,39)
Meerut 31 (21,43)
Bulandshahr 27 (27,46)

Agra Division
Aligarh 40 (39,45)
Muthra 45 (40,44)
Agra 27 (30,29)
Mainpuri 26 (19,40)
Etah 36 (35,38)
Jhansi Division
Banda 34 (33,17)
Hamirpur 24 (22,3)
Jhansi 30 (34,6)
Jalaun 42 (36,37)

Kumaon Division.
Naini Tal 46 (46,2)
Rohilkhand Division
Shahajahanpur 19 (18,25)
Pilibhit 18 (19,9)
Moradabad 33 (36,21)
Bareilly 20 (23,27)
Budaun 23 (25,32)
Lucknow Division
Kheri 35 (37,36)
Sitapur 11 (10,26)
Hardoi 25 (29,20)
Lucknow 10 (12,13)
Unao 6 (8,12)
Rae Barelli 17 (17,19)
Allahabad Division
Farrukhabad 29 (26,34)
Etawah 11 (10,26)
Cawnpore 44 (44,42)
Fatehpur 16 (16,33)

Gorakhpur Division.
Basti 4 (4,7)
Gorakhpur 5 (6,11)
Azamgarh 12 (9,31)
Fyzabad Division
Gonda 7 (3,18)
Bahraich 9 (13,8)
Bara Banki 8 (7,30)
Fyzabad 2 (2,15)
Sultanpur 1 (1,4)
Partapgarh 14 (15,24)
Banaras Division
Ballia 15 (11,23)
Jaunpur 3 (5,10)
Ghazipur 32 (31,35)
Banaras 38 (38,41)
Mirzapur 13 (14,5)

It will be seen that the incidence of contagious diseases is heavy in the western districts comprised in Meerut Division and Agra Division and in the Jhansi Division. The incidence of rinderpest is generally heavy in all these districts; the incidence of haemorrhagic septicaemia is also heavy in all the districts of Meerut and Agra Divisions, except the submontane districts of Dehra Dun and Saharanpur in Meerut Division, but is light in all districts except Jalaun in the Jhansi Division. On the other hand, the incidence of contagious disease is generally the lightest in the districts of Lucknow Division (with the exception of the submontane district of Kheri), Fyzabad Division and Gorakhpur Division. Rohilkhand Division could be described as a division of medium incidence as regards both the diseases. The Banaras division also shows a light incidence except for the districts of Ghazipur and Banaras where both rinderpest and Haemorrhaegic Septicaemia were heavy in incidence. In the Allahabad Division, the incidence may be described as heavy in Cawnpore, medium in Farrukhabad, and Allahabad and light in Etawah and Fatehpur.

6. In order to examine whether there is a tendency for the heavy incidence of the two diseases to be associated together, we may describe the incidence of disease in the district with the ranks 1 to 15 as 'light', that in districts with ranks 16 to 30 as 'medium' and that in districts with ranks 31 to 46 as 'heavy'. It is then found that among 16 districts with heavy incidence of rinderpest , 9 also show heavy incidence of haemorrhaegic septicaemia; 4 are associated with medium incidence of the latter; while there are three where the incidence of haemorrhaegic septicaemia is very light. These last are Dehra Dun, Nainital and Jhansi. Similarly, of the 15 districts with a light incidence of rinderpest, 9 have also light incidence of haemorrhagic septicaemia, and 1 has a heavy but not very heavy incidence, the remaining four having a medium incidence of the latter disease.

7. Another useful comparison that could be made on the basis of this data is as regards the relative susceptibility of oxen and buffaloes to the various forms of contagious diseases. Figures for each year of the quinquennium ending in 1940-41 have been presented in Table IV(A). It will be seen from this that both as regards rinderpest and haemorrhagic septicaemia buffaloes show a very much greater susceptibility.

This may be seen from the following table:

Annual number of deaths for thousand animals of respective species.

| | Oxen | Buffaloes. |
|---|---|---|
| Rinderpest | 0.44 | 1.22 |
| Haemorrhagic Septicaemia | 0.17 | 0.60 |

This tendency is apparent during each year of the period studied. In Madras, the incidence of rinderpest among oxen was, slightly but consistently, heavier. The heavier incidence of haemorrhaegic septicaemia among buffaloes was also seen in Madras, but there it was much less pronounced. Blackquarter in Madras had a much heavier incidence among oxen, but in U.P. it has almost equal incidence among the two species. Foot and mouth disease and anthrax have shown a heavier incidence among oxen in both the provinces.

8. It may be worthwhile at this stage giving some idea of the main breeding areas in the province. There are three main breeds in the province, viz. Mewati or Kosi, Kherigarh and Ponwar breeds. The Mewati breed is a general utility breed in which bullocks are good for work and cows are good milkers yielding

about 10 lbs. of milk per day. The habitat of the breed is the Kosi Tract of Mathu district and the states of Alwar and Bharatpur. Its area of demand is comprised of the districts of Agra, Mathura and Aligarh and adjoining states. The strength of the breed has been estimated as 4 lakhs of animals. Both the Kherigarh and Ponwar breeds, on the other hand, are found in the Northern districts. The Kherigarh is a draught breed in which bullocks are good for light work but cows are poor milkers. The habitat of the breed is the tract north of Gogra, between the rivers Sarju and Mohan, the present specimens being found in Kheri district. The area of demand extends over the districts of Oudh, Bareilly and Gorakhpur division. The Ponwar breed is famous for its bullocks which are good for both plough and for road; the cows of the breed yield about 4 lbs. of milk daily. Its habitat is the Puranpur tahsil of Pilibhit district and N.W. part of Kheri district. The areas of demand comprise the Tarai districts of U.P., Bareilly, Moradabad, Pilibhit, Bahraich, Basti, etc. The combined strength of Kherigarh and Ponwar breeds has been estimated as 67 lakhs.

Mr. W.H. Moreland in his Notes on the Agricultural Conditions and Problems of the United Provinces ( 1913) has included a note on the Cattle Supply of the province in which he presents considerable information about the breeding industry in the province. In the breeding tracts, the production of cattle is carried on in two ways, which may be described as professional breeding and village breeding. In professional breeding we find men owning herds of cows of considerable size and specialising in the production of agricultural cattle, as their sole or at least as a principal occupation in life. In village breeding we find landholders owning cows in varying numbers and selling the young stock that is in excess of their needs. Mr. Moreland has pointed out that the cows in the province could be described as belonging to three nations ( he uses this term to avoid misuse of words like 'breed' which have a definite technical meaning), western, northern and southern. Cows of the Western nation are found in the Meerut and Agra Divisions (uplands and Jumna Khadir and not the Ganges Khadir), and as far East as Etawah. Those of the Southern 'nation' are found in Bundelkhand and Mirzapur. The northern 'nation' prevails throughout the whole submontane breeding tract from the Ganges lowland in Muzaffarnagar on the West to Bahraich and Gonda on the East. It reaches its best in the Kherigarh, Parehar and Ponwar breeds. He suggests that there may be a fourth, or Eastern nation in Gorakhpur, Ballia and adjoining district

Mr. Moreland has also given the results of a Survey of the breeding industry in the different districts. The distribution of village breeding practically follows that of professional breeding, but its limits are naturally wider; each centre of professional breeding is surrounded by a wider tract in which village breeding is important. The professional breeding is practically confined to the following areas:

I. Submontane areas: Bijnor, Moradabad, Shahjahanpur, Pilibhit,
Sitapur, Hardoi, Kheri, Bahraich.

II. Areas South of Jumna: Etawah, Mirzapur.

III. Other areas: Muzaffarnagar, Meerut.

It will be seen from the foregoing information that the most important breeding tract in the province comprises the Central Submontane districts. Areas may be found in this tract in which the incidence of contagious disease is medium or light. The districts of Etawah and Mirzapur also showed a low incidence of contagious disease. On the other hand, Muzaffarnagar and Meerut showed a heavy mortality due to contagious diseases. Cattle insurance had been tried in the U.P. in the districts of Budaun (Rohilkhand division) and Mainpuri (Agra division). In 1915-16 there were four Cattle Insurance Societies in Mainpuri and one in Budaun, but by the end of the year 1920 all these had been liquidated.

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## T A B L E I(A).

### INCIDENCE OF THE CONTAGIOUS DISEASES AMONG BOVINES IN THE UNITED PROVINCES DURING THE PERIOD 1925-26 TO 1939-40.

| | | Rinderpest | Haemorrhagic Septicaemia | Foot and mouth disease. | Anthrax | Black quarter | Other contagious diseases | All contagious diseases. |
|---|---|---|---|---|---|---|---|---|
| 1. Number of deaths per annum during the period 1925-26 to 1939-40. | Average | 27,451 | 7,200 | 1,912 | 699 | 602 | 575 | 38,439 |
| | Maximum | 47,761 | 12,248 | 6,590 | 1,879 | 1,304 | 1,240 | 55,610 |
| | Minimum | 13,479 | 2,674 | 605 | 275 | 139 | 151 | 25,413 |
| 2. Coefficient of Variability of the number of deaths. | | 36.86 | 38.33 | 75.93 | 63.75 | 57.67 | 55.93 | 25.92 |
| 3. Average number of deaths per thousand bovines. | (a) | 0.84 | 0.22 | 0.06 | 0.02 | 0.02 | 0.02 | 1.18 |
| 4. Proportion of deaths to deaths due to all causes | | 0.71 | 0.19 | 0.05 | 0.02 | 0.02 | 0.01 | 1.00 |
| 5. Number of outbreaks per year, in which inoculation was undertaken. | Average | 1,325 | 575 | - | 18 | 44 | - | 1,962 |
| | Maximum | 2,119 | 1,238 | - | 84 | 158 | - | 3,427 |
| | Minimum | 621 | 184 | - | - | 4 | - | 1,153 |
| 6. Average annual number of villages affected. | (b) | 1,748 | 1,306 | - | 66 | 94 | - | 3,214 |
| 7. Number of deaths per outbreak | | 20.72 | 12.52 | - | 38.83 | 13.68 | - | 19.59 |
| 8. Mortality per thousand bovines in affected areas | (c) | 47.41 | 17.39 | - | 46.60 | 22.30 | - | 37.18 |

(a) Population figures relate to 1934-35 Census.
(b) Figures relate to the quinquennium ending 1940-41.
(c) Figures for the average bovine population in affected villages for each disease during the quinqunnium ending 1940-41 are assumed to apply to the entire periods.

Table showing for each contagious disease and in each year the following:

(a) Deaths per thousand bovine animals in the province (1)
(b) Number of out-breaks in which inoculation was undertaken,
(c) Deaths per out-break.

| Disease/year | | 1925-26 | 1926-27 | 1927-28 | 1928-29 | 1929-30 | 1930-31 | 1931-32 | 1932-33 | 1933-34 | 1934-5 | 1935-6 | 1936-7 | 1937-38 | 1938-9 | 1939-40 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RINDERPEST | (a) | 0.76 | 0.68 | 0.95 | 0.42 | 1.10 | 0.80 | 1.47 | 1.34 | 1.25 | 0.46 | 0.57 | 0.64 | 0.53 | 0.84 | 0.86 |
| | (b) | 915 | 980 | 1,464 | 621 | 1,276 | 1,294 | 1,739 | 1,649 | 1,284 | 1,075 | 1,128 | 1,259 | 1,121 | 1,947 | 2,119 |
| | (c) | 27.08 | 22.56 | 21.00 | 21.71 | 28.09 | 20.03 | 27.46 | 26.44 | 31.50 | 14.03 | 16.42 | 16.60 | 15.42 | 14.05 | 13.19 |
| HAEMORRHAGIC SEPTICAEMIA | (a) | 0.12 | 0.08 | 0.09 | 0.22 | 0.24 | 0.21 | 0.17 | 0.21 | 0.25 | 0.26 | 0.19 | 0.38 | 0.20 | 0.37 | 0.32 |
| | (b) | 233 | 184 | 523 | 466 | 446 | 374 | 327 | 361 | 409 | 563 | 617 | 942 | 823 | 1,238 | 1,113 |
| | (c) | 17.39 | 14.53 | 5.92 | 15.62 | 17.68 | 18.02 | 16.86 | 18.50 | 20.22 | 15.04 | 10.24 | 13.00 | 7.70 | 9.69 | 0.37 |
| FOOT & MOUTH DISEASE | (a) | 0.20 | 0.08 | 0.11 | 0.06 | 0.07 | 0.05 | 0.04 | 0.05 | 0.03 | 0.04 | 0.04 | 0.02 | 0.04 | 0.02 | 0.03 |
| | (b) | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | (c) | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| ANTHRAX | (a) | 0.06 | 0.04 | 0.03 | 0.03 | 0.01 | 0.02 | 0.01 | 0.01 | 0.03 | 0.01 | 0.01 | 0.01 | 0.02 | 0.08 | 0.01 |
| | (b) | 6 | 6 | 3 | - | 10 | 4 | - | 13 | 12 | 10 | 8 | 23 | 46 | 84 | 62 |
| | (c) | - | - | 306.33 | - | 28.80 | 123.75 | - | 30.31 | 77.00 | 27.50 | 38.75 | 15.26 | 15.28 | 11.88 | 7.26 |
| BLACK-QUARTER | (a) | 0.01 | 0.01 | 0.01 | 0.04 | 0.02 | 0.04 | 0.02 | 0.01 | 0.01 | 0.01 | 0.00 | 0.02 | 0.01 | 0.03 | 0.02 |
| | (b) | 5 | 4 | 16 | 77 | 45 | 71 | 29 | 25 | 30 | 29 | 13 | 59 | 45 | 158 | 62 |
| | (c) | 80.80 | 92.50 | 13.69 | 16.94 | 11.76 | 17.00 | 24.90 | 22.44 | 19.20 | 7.31 | 10.70 | 10.83 | 8.67 | 7.00 | 10.16 |
| OTHER CONTAGIOUS DISEASES | (a) | 0.04 | 0.02 | 0.03 | 0.01 | 0.01 | 0.01 | 0.00 | 0.02 | 0.02 | 0.01 | 0.01 | 0.02 | 0.04 | 0.03 | 0.01 |
| | (b) | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | (c) | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| TOTAL CONTAGIOUS DISEASE | (a) | 1.20 | 0.92 | 1.21 | 0.78 | 1.45 | 1.12 | 1.71 | 1.64 | 1.60 | 0.79 | 0.82 | 1.09 | 0.84 | 1.32 | 1.26 |
| | (b) | 1,153 | 1168 | 2007 | 1164 | 1777 | 1743 | 2095 | 2048 | 1735 | 1677 | 1766 | 2283 | 2035 | 3427 | 3356 |
| | (c) | 33.70 | 25.51 | 19.56 | 21.83 | 26.43 | 20.89 | 26.55 | 26.05 | 29.96 | 15.28 | 15.17 | 15.52 | 13.33 | 72.55 | 12.21 |

(1) Population figures used relate to 1934-35 Census.

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# T A B L E III (A)

Incidence of mortality due to contagious diseases among bovines in different districts of United Provinces during the period 1924-25 to 1933-34

| DISTRICT | BOVINE POPULATION ACCORDING 1934-5 CENSUS (THOUSANDS) | ANNUAL NUMBER OF DEATHS PER THOUSAND BOVINE ANIMALS DUE TO | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | RINDERPEST | | | HAEMORRHAGIC SEPTICAEMIA | FOOT & MOUTH | ANTHRAX | BLACK QUARTER | OTHER CONTAGIOUS DISEASE | TOTAL CONTAGIOUS DISEASES | | |
| | | AVERAGE | MAXIMUM | MINIMUM | AVERAGE | Average | AVERAGE | AVERAGE | AVERAGE | AVERAGE | MAXIMUM | MINIMUM |
| 1. | 2. | 3. | 4. | 5. | 6. | 7. | 8. | 9. | 10. | 11. | 12. | 13. |
| 1. DEHRADUN | 170 | 2.13 | 5.25 | 0.06 | 0.00 | 0.10 | 0.01 | 0.00 | 0.00 | 2.24 | 5.61 | 0.10 |
| 2. SAHARANPUR | 644 | 1.48 | 5.67 | 0.11 | 0.14 | 0.16 | 0.03 | 0.01 | 0.09 | 1.91 | 6.50 | 0.32 |
| 3. MUZAFFARNAGAR | 523 | 1.44 | 4.12 | 0.09 | 0.33 | 0.16 | 0.09 | 0.03 | 0.01 | 2.06 | 5.57 | 0.46 |
| 4. MEERUT | 828 | 0.86 | 2.99 | 0.18 | 0.35 | 0.13 | 0.01 | 0.01 | 0.05 | 1.41 | 3.92 | 0.46 |
| 5. BULANDSHAHR | 605 | 1.00 | 1.99 | 0.14 | 0.65 | 0.11 | 0.04 | 0.01 | 0.01 | 1.82 | 2.31 | 0.84 |
| 6. ALIGARH | 618 | 1.33 | 3.37 | 0.24 | 0.53 | 0.09 | 0.02 | 0.01 | 0.00 | 1.98 | 4.19 | 0.80 |
| 7. MUTTRA | 433 | 1.43 | 7.00 | 0.15 | 0.39 | 0.40 | 0.08 | 0.01 | 0.01 | 2.32 | 8.23 | 0.35 |
| 8. AGRA | 609 | 1.05 | 2.70 | 0.24 | 0.18 | 0.03 | 0.00 | 0.00 | 0.08 | 1.34 | 2.96 | 0.39 |
| 9. MAINPURI | 586 | 0.84 | 1.55 | 0.29 | 0.34 | 0.07 | 0.02 | 0.01 | 0.04 | 1.32 | 2.26 | 0.60 |
| 10. ETAH | 630 | 1.23 | 3.48 | 0.16 | 0.32 | 0.06 | 0.08 | 0.02 | 0.00 | 1.71 | 4.06 | 0.44 |
| 11. BAREILLY | 609 | 0.87 | 1.97 | 0.12 | 0.18 | 0.03 | 0.04 | 0.02 | 0.00 | 1.14 | 2.68 | 0.35 |
| 12. BIJNOR | 556 | 1.02 | 2.62 | 0.40 | 0.08 | 0.03 | 0.03 | 0.00 | 0.00 | 1.16 | 2.77 | 0.17 |
| 13. BUDAUN | 688 | 0.91 | 2.63 | 0.09 | 0.20 | 0.02 | 0.06 | 0.03 | 0.00 | 1.22 | 3.01 | 0.19 |
| 14. MURADABAD | 763 | 1.23 | 3.85 | 0.27 | 0.14 | 0.02 | 0.12 | 0.01 | 0.03 | 1.55 | 4.14 | 0.27 |
| 15. SHAHJAHAN-PUR | 632 | 1.84 | 2.24 | 0.14 | 0.17 | 0.04 | 0.03 | 0.02 | 0.00 | 1.10 | 2.40 | 0.23 |
| 16. PILIBHIT | 333 | 0.86 | 2.12 | 0.04 | 0.05 | 0.08 | 0.03 | 0.02 | 0.00 | 1.04 | 2.30 | 0.25 |
| 17. FARRUKHABAD | 581 | 0.96 | 2.40 | 0.15 | 0.21 | 0.08 | 0.04 | 0.02 | 0.04 | 1.35 | 2.68 | 0.36 |
| 18. ETAWAH | 550 | 0.87 | 2.33 | 0.15 | 0.18 | 0.06 | 0.01 | 0.01 | 0.05 | 1.18 | 2.69 | 0.33 |

| 1. | 2. | 3. | 4. | 5. | 6. | 7. | 8. | 9. | 10. | 11. | 12. | 13. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 19. CAWNPORE | 787 | 1.73 | 6.64 | 0.08 | 0.35 | 0.00 | 0.03 | 0.06 | 0.02 | 2.28 | 7.41 | 0.22 |
| 20. FATEHPUR | 556 | 0.68 | 1.87 | 0.04 | 0.21 | 0.09 | 0.00 | 0.00 | 0.00 | 0.98 | 1.95 | 0.17 |
| 21. ALLAHABAD | 1011 | 1.12 | 5.01 | 0.03 | 0.11 | 0.07 | 0.01 | 0.00 | 0.03 | 1.34 | 5.29 | 0.04 |
| 22. JHANSI | 884 | 1.21 | 5.93 | 0.29 | 0.05 | 0.06 | 0.01 | 0.07 | 0.00 | 1.40 | 6.17 | 0.33 |
| 23. JALAUN | 309 | 1.66 | 5.17 | 0.20 | 0.30 | 0.05 | 0.07 | 0.03 | 0.01 | 2.12 | 5.40 | 0.60 |
| 24. HAMIRPUR | 585 | 0.87 | 2.88 | 0.01 | 0.03 | 0.21 | 0.10 | 0.02 | 0.00 | 1.23 | 3.47 | 0.05 |
| 25. BANDA | 753 | 1.17 | 3.52 | 0.18 | 0.12 | 0.15 | 0.12 | 0.01 | 0.02 | 1.59 | 3.95 | 0.36 |
| 26. BANARAS | 430 | 1.29 | 7.24 | 0.00 | 0.34 | 0.04 | 0.04 | 0.01 | 0.10 | 1.82 | 7.61 | 0.18 |
| 27. MIRZAPUR | 819 | 0.60 | 1.59 | 0.05 | 0.04 | 0.09 | 0.05 | 0.00 | 0.00 | 0.78 | 1.74 | 0.15 |
| 28. JAUNPUR | 739 | 0.25 | 1.12 | 0.02 | 0.07 | 0.02 | 0.00 | 0.01 | 0.01 | 0.36 | 1.14 | 0.12 |
| 29. GHAZIPUR | 518 | 1.09 | 6.34 | 0.02 | 0.24 | 0.10 | 0.04 | 0.03 | 0.01 | 1.51 | 6.57 | 0.22 |
| 30. BALLIA | 448 | 0.46 | 1.56 | 0.01 | 0.15 | 0.06 | 0.01 | 0.22 | 0.00 | 0.90 | 2.11 | 0.05 |
| 31. GORAKHPUR | 1770 | 0.31 | 1.16 | 0.01 | 0.07 | 0.03 | 0.00 | 0.01 | 0.00 | 0.42 | 1.33 | 0.04 |
| 32. BASTI | 1272 | 0.24 | 0.53 | 0.01 | 0.06 | 0.02 | 0.03 | 0.00 | 0.02 | 0.37 | 0.71 | 0.04 |
| 33. AZAMPUR | 992 | 0.39 | 1.03 | 0.05 | 0.19 | 0.04 | 0.02 | 0.04 | 0.01 | 0.69 | 1.52 | 0.19 |
| 34. NAINITAL | 362 | 2.49 | 17.62 | 0.01 | 0.01 | 0.35 | 0.00 | 0.03 | 0.01 | 3.39 | 17.62 | 0.03 |
| 35. ALMORA | | | | | | | | | | | | |
| 36. GARHWAL | | | | | | | | | | | | |
| 37. LUCKNOW | 359 | 0.52 | 2.28 | 0.06 | 0.08 | 0.01 | 0.00 | 0.01 | 0.01 | 0.63 | 2.29 | 0.19 |
| 38. UNAO | 667 | 0.35 | 1.14 | 0.02 | 0.07 | 0.01 | 0.00 | 0.00 | 0.01 | 0.44 | 1.18 | 0.07 |
| 39. RAE BARELI | 773 | 0.83 | 1.65 | 0.03 | 0.13 | 0.02 | 0.01 | 0.04 | 0.01 | 1.04 | 3.17 | 0.05 |
| 40. SITAPUR | 1012 | 0.40 | 0.91 | 0.07 | 0.18 | 0.02 | 0.00 | 0.03 | 0.01 | 0.64 | 1.07 | 0.18 |
| 41. HARDOI | 859 | 1.03 | 2.02 | 0.05 | 0.13 | 0.02 | 0.04 | 0.02 | 0.00 | 1.24 | 2.15 | 0.22 |

Contd

| 1. | 2. | 3. | 4. | 5. | 6. | 7. | 8. | 9. | 10. | 11. | 12. | 13. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 42. KHERI | 963 | 1.26 | 5.24 | 0.06 | 0.24 | 0.06 | 0.01 | 0.02 | 0.00 | 1.59 | 5.43 | 0.12 |
| 43. FYZABAD | 789 | 0.19 | 0.45 | 0.01 | 0.10 | 0.02 | 0.01 | 0.00 | 0.00 | 0.32 | 0.67 | 0.07 |
| 44. GONDA | 1273 | 0.23 | 0.80 | 0.00 | 0.12 | 0.09 | 0.02 | 0.00 | 0.02 | 0.48 | 1.33 | 0.15 |
| 45. BAHRAICH | 1088 | 0.52 | 1.14 | 0.00 | 0.06 | 0.02 | 0.01 | 0.00 | 0.00 | 0.61 | 1.38 | 0.03 |
| 46. SULTANPUR | 770 | 0.15 | 0.34 | 0.03 | 0.04 | 0.01 | 0.01 | 0.01 | 0.00 | 0.22 | 0.35 | 0.06 |
| 47. PARTAPGARH | 651 | 0.66 | 1.79 | 0.00 | 0.16 | 0.02 | 0.00 | 0.00 | 0.00 | 0.84 | 2.27 | 0.03 |
| 48. BARA BANKI | 673 | 0.34 | 0.75 | 0.00 | 0.19 | 0.02 | 0.01 | 0.00 | 0.00 | 0.56 | 1.12 | 0.00 |

POPULATION FIGURES FOR ALMORA AND GARHWAL NOT AVAILABLE.

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## T_A_B_L_E IV (A)

Annual number of deaths in the United Provinces due to contagious diseasesamong oxen and buffaloes per thousand animals of the respective species during the period 1936-37 to 1940-41

| Causes | 1936-37 | | 1937-38 | | 1938-39 | | 1939-40 | | 1940-41 | | Whole period | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Oxen | Buffaloes | Oxen | Buffaloes | Oxen | Buffaloes | Oxen | Buffaloes | Oxen | Buffaloes | Oxen | Buffaloes |
| RINDERPEST | 0.43 | 1.19 | 0.34 | 1.02 | 0.59 | 1.47 | 0.53 | 1.69 | 0.29 | 0.72 | 0.44 | 1,22 |
| HAEMORRHAGIC SEPTICAEMIA | 0.21 | 0.79 | 0.13 | 0.35 | 0.21 | 0.77 | 0.18 | 0.67 | 0.11 | 0.45 | 0.17 | 0.60 |
| FOOT AND MOUTH | 0.02 | 0.01 | 0.03 | 0.05 | 0.02 | 0.01 | 0.04 | 0.02 | 0.02 | 0.01 | 0.03 | 0.02 |
| ANTHRAX | 0.01 | 0.01 | 0.02 | 0.02 | 0.04 | 0.02 | 0.02 | 0.01 | 0.01 | 0.01 | 0.02 | 0.01 |
| BLACKQUARTER | 0.02 | 0.01 | 0.01 | 0.01 | 0.04 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
| OTHER CONTAGIOUS DISEASE | 0.02 | 0.02 | 0.04 | 0.04 | 0.02 | 0.03 | 0.01 | 0.02 | 0.01 | 0.03 | 0.02 | 0.03 |
| TOTAL CONTAGIOUS DISEASE. | 0.71 | 2.03 | 0.57 | 1.49 | 0.92 | 2.32 | 0.80 | 2.43 | 0.46 | 1.24 | 0.70 | 1.90 |

* PUPULATION FIGURES RELATE TO 1934-35 CENSUS.

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## SUMMARY OF CONCLUSIONS

1. Before inaugurating a Pilot Scheme of Cattle Insurance, it will be advisable to undertake investigations into mortality of cattle of different classes in different regions.

A valuable source of data for this purpose may be found in the records of the Military Dairy farms and other government Cattle farms in India. The data so obtained may be supplemented by information obtained through sample enquiries in the areas operation of the scheme. A detailed procedure for such investigations is outlined.

2. In India Cattle Insurance will have to provide protection against losses due to contagious diseases.

The incidence of contagious disease varies considerably between different classes of animals and between different areas. Areas in which the incidence is comparatively lighter may be selected for the operation of the pilot schemes.

In addition, provision may be made for regular and compulsory protection of all insured animals against rinderpest by the Serum Simultaneous method in all cases, and against anthrax, haemorrhagic septicaemia and blackquarter at least in those tracts where these diseases are of most common occurrence. Protection may be provided by the Veterinary Departments concerned without any charge for inoculation serum, etc.

3. The existing field agencies of the provincial Veterinary Departments cannot be considered as adequate for providing necessary veterinary facilities in connection with a scheme of Cattle Insurance. Additional facilities will have to be provided in the areas of operation of the scheme.

4. A form of contract of Cattle Insurance, under which the benefit is payable not only on death of the animal during a prescribed period but also on its surviving that period, is described. This may prove more popular in India as compared with the usual form of term insurance contract and may be tried in selected areas according to local preferences.

5. In view of the objectives of a pilot scheme of Cattle Insurance, it will be advisable to spread the operations of the scheme to selected centres in different provinces instead of confining the operations to a single province.

6. Insurance may be offered in two typesof centres. In rural centres insurance may be confined to working bullocks between specified age limits. In urban centres, comprising of cities and surrounding areas, insurance may be extended to milch animals also.

Six rural centres and six urban centres are suggested for the operation of the pilot scheme. The actual selection of the areas may be done in consultation with the provincial governments concerned. It will be desirable to have 1000 to 2000 insured animals in each centre. A rural centre may comprise an area of approximately 300 sq. miles. An urban centre may include the city and an area within a distance of 5 miles from the city.

7. A pilot scheme of Cattle Insurance could be operated through Cooperative Cattle Insurance Societies, with state-aid in various forms, or as a purely state-managed scheme. In view of the nature of considerations that must guide the choice, it may be advisable to obtain opinions of provincial governments on this point. A suitable machinery for operation of the pilot scheme is outlined in respect of each form of organisation.

8. The following machinery is suggested for operating a pilot scheme administered through Cattle Insurance Societies:

(a) Three Cooperative societies may operate in each rural centre, each with an area of operation of about 100 sq. miles. A single society may operate in an urban centre. There will thus be 18 rural societies and 6 urban societies.

(b) The societies may be given government help in the following forms during the pilot scheme stage:

(i) An Establishment Grant may be given to each Society at inception, which, together with the share capital of the Society, will form the nucleus of a reserve fund.

(ii) Veterinary help of all kinds may be provided free of cost to the insured by the Veterinary Departments concerned.

(iii) Government may reinsure half the risk in respect of each policy, on receiving half the premium from the society.

(iv) Government may also make annual grants for secretarial expenses.

(v) In addition to this, government may guarantee interest-free loans to the societies during those years when the funds of the society are found inadequate to pay the claims.

(c) The administrative staff may comprise the following:

(i) A full-time Cattle Insurance Officer in each province assisted by a clerk and a peon. He will be a veterinarian.

(ii) A Manager of Cattle Insurance at the Centre, assisted by an Accountant, two clerks a stenographer and two peons. He may be guided by a Central Directing Committee.

9. The following machinery is suggested for operating a completely state-managed pilot scheme:

Each rural and urban centre may be placed in charge of a Cattle Insurance Officer who may be assisted by a clerk and a peon. The Officer will be a veterinarian and will work in close cooperation with the Veterinary Department concerned.

Further, each centre may be divided into 3 subcentres, and a stock-supervisor who will form part of the normal field agencies of the provincial Veterinary Departments will be made available in each subcentre to perform the field operations in connection with the Cattle Insurance scheme. The stock supervisor will be paid a small honorariumfor his services.

The work of selling insurance may be organised by appointing agents, who may be individuals or institutions like cooperative societies, on a commission basis.

Expert cattle-owners belonging to the respective areas may be associated with the work of valuation of animals, and remunerated with an honorarium.

Death of insured animals may be required to be vouched and certified by persons of experience and standing in the respective areas. A panel of such persons may be formed in each area and a small fee paid in respect of each certificate.

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